RR

JUNE 5, 1954

Vol. 146 — No. 23

UNIVERSITY
OF MICHIGAN

JUN 10 1954

ENGINEERING
LIBRARY

MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING •

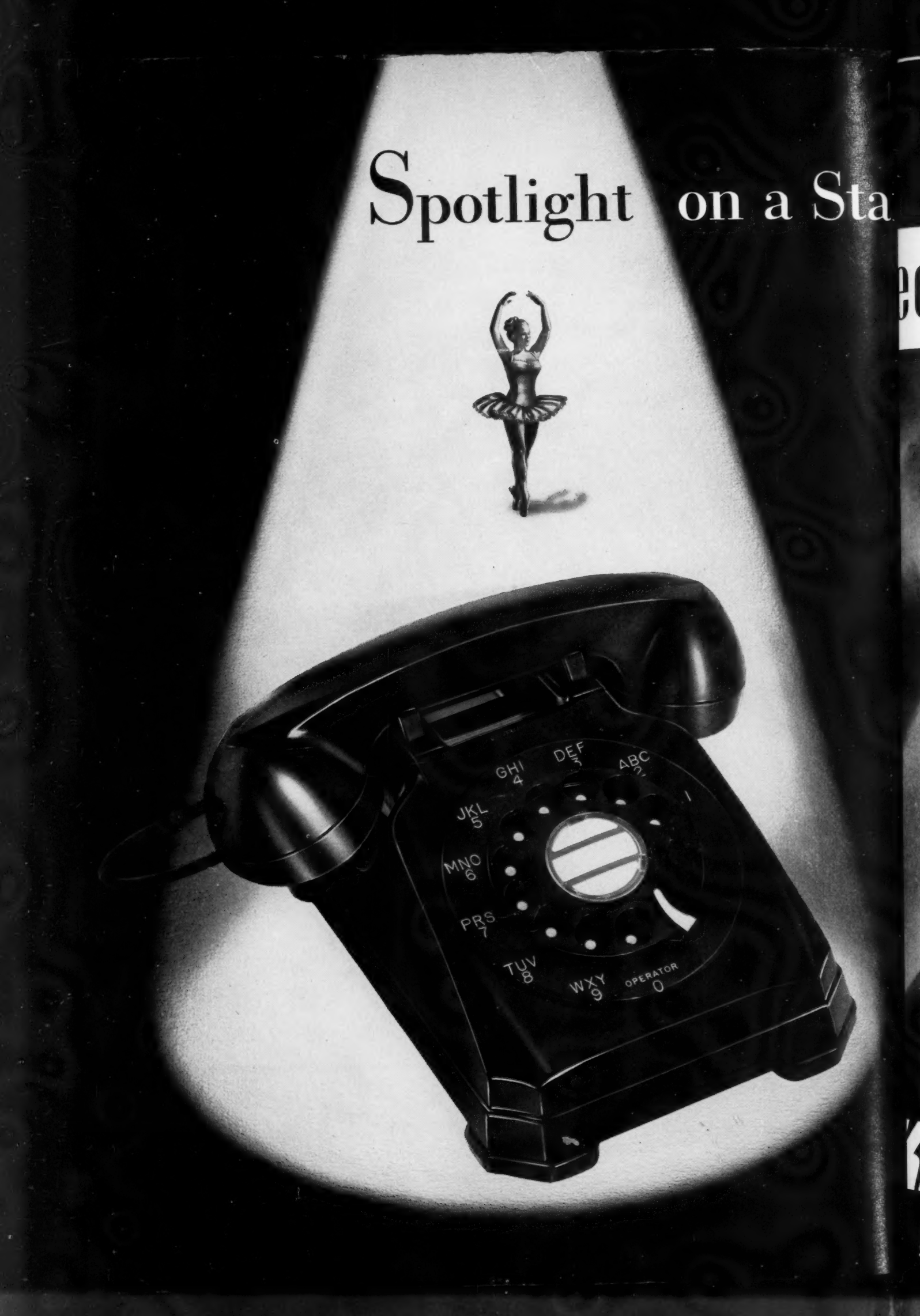
Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

Published every week on Saturday by TELEPHONY PUBLISHING CORPORATION, 608 South Dearborn Street, Chicago 5, Illinois. Subscription $3.50 per year. Entered as second class matter at the Post Office at Chicago, Illinois, under the act of March 3, 1879.

Guaranteed Circulation This Issue

10,035, of Which 9,508 Is Paid


Spotlight on a Sta
GHI 4
DEF 3
ABC 2
1
JKL 5
MNO 6
PRS 7
TUV 8
WXY 9
OPERATOR 0

a

eeds *today!*

SINCE 1897
KELLOGG

GET THE FACTS—MAIL THIS COUPON TODAY

This interesting, instructive booklet is yours for the asking. Ask for it NOW!

KELLOGG DIVISION OF IT&T

KELLOGG SWITCHBOARD AND SUPPLY COMPANY

A Division of International Telephone and Telegraph Corporation

SALES OFFICE: 79 WEST MONROE STREET, CHICAGO 3, ILLINOIS

Warehouses: Chicago 38 • Kansas City 1 • Mansfield, Ohio • St. Paul 4
Dallas 2 • San Francisco 3

Branch Offices: New York 7 • Portland 5 • Los Angeles 13

Export: International Standard Electric Corporation, New York 7, N. Y., U. S. A.

KELLOGG *Crossbar*
10 to 10,000 Lines

SUPERIORITY— PROVED BY USE

FLASHES AND PLUGS

CURIOSITY. In a story on Ulysses S. Grant, the General Telephone Co. of Illinois *News* reported that the telephone had just been invented and an instrument was put on a White House desk.

A trial convinced President Grant that he could talk through it to another person and hear the reply.

"Yes," said the man who had led great armies to victory and was at the very height of his reputation, "it is all very remarkable. But who in the world would ever want to use one of them?"

• • •

CURT BUT CORRECT. The Illinois Bell Telephone *News* recently said:

"Correct telephone usage is to identify oneself right away. It not only saves time but also helps to prevent any misunderstanding. A case in point is that of the irritable customer, the astonished clerk and the hungry horse.

"The setting was a grain and feed store. The telephone rang.

" 'Send me,' said an unknown voice, 'a bale of hay and a sack of oats.'

"After jotting this down, the clerk asked politely, 'And whom are they for?'

" 'For the horse,' said the angry voice, 'who did you think?' And the receiver was hung up sharply."

• • •

ADVICE. Two lunatics, each firm in the belief that he was a lifeguard, escaped from an asylum and were trudging along the road in search of an ocean.

Presently they came to a large wheat field which was rippling in the breeze a lot like the waves in a sea. Removing their clothes, they scrambled up a telephone pole and the first man dived off.

A moment later his head dazedly emerged from the wheat. "Dive to the left," he cautioned his companion, "I struck a sandbar."—GENERAL TELEPHONE CO. OF WISCONSIN *News*.

• • •

HOW TRUE, MAN! Columnist Hy Gardner, writing in *Parade* about interesting telephone interviews, recently said:

"Former President Truman is one of the easiest international figures to find by telephone. When at home, he invariably responds to the jingle himself.

"Once, I called to ask whether rumors I'd heard were true. Mr. Truman denied each categorically, then admitted he didn't mind what false rumor was published about him.

" 'They'd have to say something awfully mean about me to say something new', he quipped."

• • •

COMMENT. We've heard: What every home needs is a telephone with a built-in bathtub.

CIRCULATION

Guaranteed circulation of this issue is 10,035, of which 9,508 is paid.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

June 5, 1954

Contents

HOW CASE TRANSPOSITION BRACKETS HELP EXPAND TOLL CIRCUITS 17
By B. E. Bryngelson

IN THE NATION'S CAPITAL 19
By Francis X. Welch

THE PLANT MAN'S NOTEBOOK 21
By Ray Blain

PLANT MAN'S QUIZ 22
By Ray Blain

ILLINOIS INDEPENDENTS URGED TO GO AFTER TOLL BUSINESS 23
By R. C. Reno

WISCONSIN CONVENTION FEATURES GROWTH 26
By Dan S. Fargo

REA APPROVES SEVEN RURAL LOANS 30

A SOLAR BATTERY 31

COURTS AND COMMISSIONS 32

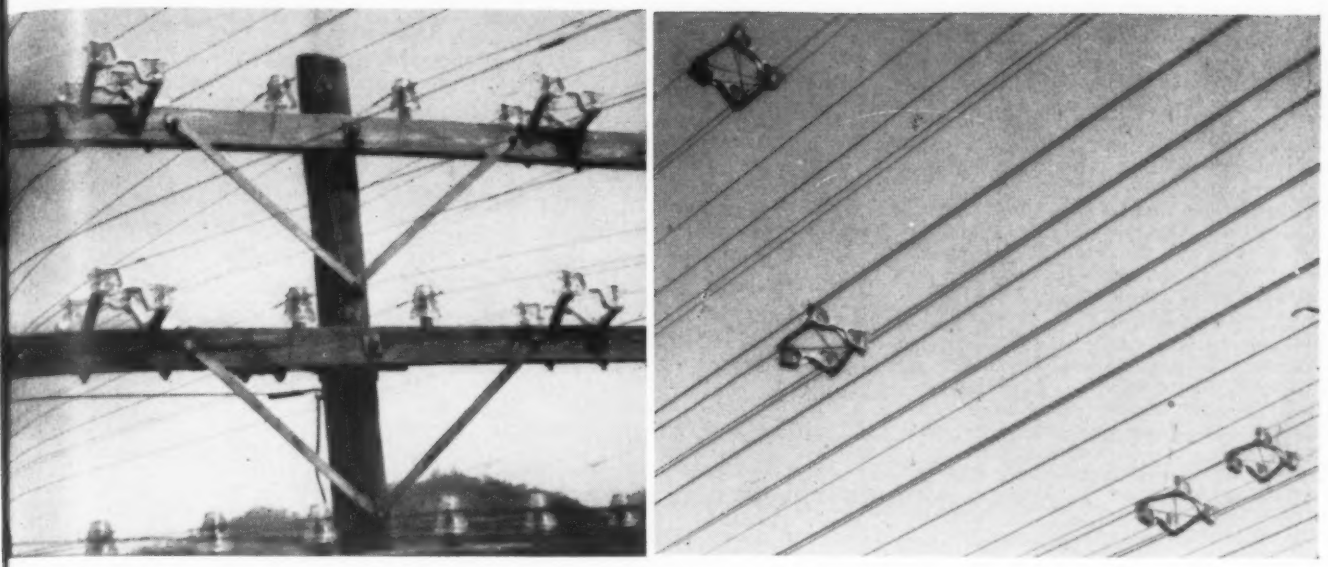
H. D. FARGO Jr., *President & Advertising Manager*
R. C. RENO, *Vice President & Editor*
H. D. FARGO, *Vice President & Treasurer*
A. J. STULTS, *Secretary & Western Manager*
DAN FARGO, *Managing Editor*
GEORGIA LEARNED, *Associate Editor*
RAY BLAIN, *Technical Editor*
FRANCIS X. WELCH, *Washington Editor*
MAYME WORKMAN, *Traffic Editor*
VIVIAN RYDEN, *Circulation Manager*

WESTERN REPRESENTATIVES:
McDonald-Thompson, San Francisco, Cal.
Also offices in Los Angeles; Seattle, Wash.; Houston, Tex., and Denver, Colo.

Published by
TELEPHONY PUBLISHING CORP.

Vol. 146, No. 23. Published every week on Saturday by TELEPHONY PUBLISHING CORPORATION, 608 South Dearborn St., Chicago (5), Ill. 20 cents per copy (except special issues). Subscription $3.50 per year U. S.; $4.50 Countries in U. S. Spanish Postal Zone; $4.50 Canada; $5.50 Other Countries.

608 S. Dearborn St., Chicago (5), Ill., U. S. A.
Telephone WAbash 2-2435



Case point transposition brackets (left) and span brackets (right) in service on Intermountain Telephone Co. lines.

How Case Transposition Brackets Help Expand Toll Circuits

By B. E. BRYNGELSON*

FOR A PERIOD of more than a half century, open wire toll circuits have gone through many drastic changes in order to keep pace with the ever changing and advancing developments in telephony. Before the days of paralleling power lines and the development of phantom circuits, transpositions were practically unheard of.

However, when circuit groups became congested, and in order to expand and also to improve circuit quality, it was found that by merely reversing the wires of a circuit, or by making a transposition, many improvements were accomplished. At first this reversing, or transposing, was accomplished by deadending the circuits in each direction on insulators and "jumpering in" to change or reverse.

This was commonly referred to as a "Butterfly" transposition, and became the topic of conversation whenever linemen would gather and wagers were often made on who could cut in a "Butterfly" transposition the quickest. However, because of trouble developing in many of the "Butterfly" transpositions, they were short lived and it became evident that an improvement was necessary. This was effected by the development of transposition brackets. By using a bracket it was found that it was not necessary to cut the line wire in transposing a circuit, and this was considered a great accomplishment.

Various developments in single and phantom type transposition brackets took place over a period of many years, until the advent of the toll circuit carrier system, which brought on a multitude of complications such as balancing-out cross-talk between carrier channels and keeping noise levels within approved transmission limits. Various transposition schemes were designed, each one to fit certain conditions.

It is not the thought of the writer to delve into any of the data pertaining to the subject of laying out transposition schemes in this article, but rather to eliminate as much technical data as possible. Therefore, the purpose of this article is to bring to the reader simplified information that will be helpful in planning new lines or retransposing existing lines. However, work of this nature should not be attempted until a thorough study has been made of all conditions involved. The following points are perhaps the most important and each should be weighed carefully:

*Mr. Bryngelson is plant superintendent of the Intermountain Telephone Co. of Bristol, Tenn.

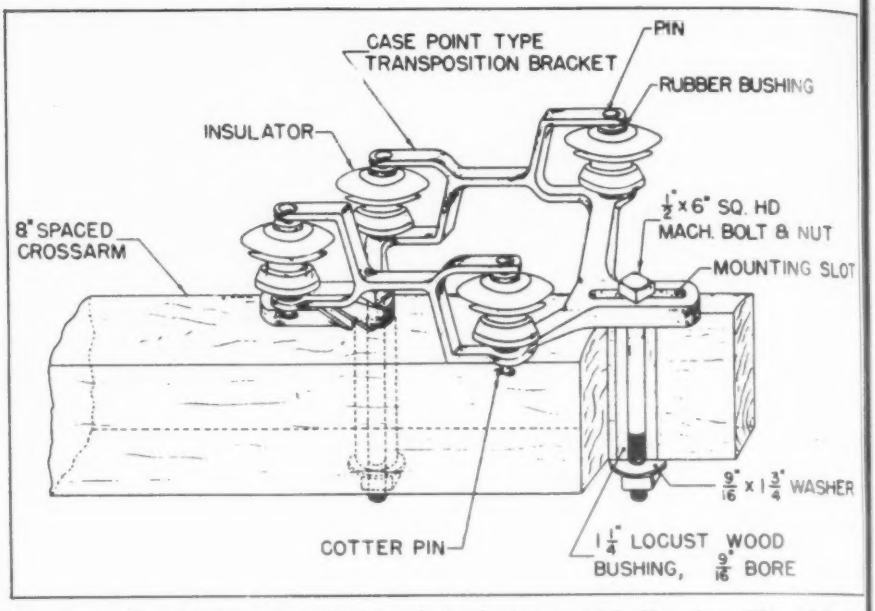
(1) A long-range toll traffic study should be made. It is necessary to know the number of toll circuits at present in each group and what the expected growth may be. These data are usually given by showing the number of circuits needed each year and it is very helpful if a period of at least 10 years is covered. This information is usually furnished by a toll traffic engineer or someone who is well qualified in making the study. The study should be as accurate as possible as much depends upon its accuracy.

(2) It will be the duty of the plant engineer to determine the most economical and satisfactory method of meeting the predicted growth, furnished by the traffic department. The engineer will determine whether present facilities can be expanded as they now exist, or modified, as in case of open wire facilities. In order to add carrier, a retransposing job may be necessary. Perhaps, too, consideration should be given to replacing the open wire facilities with cable or microwave radio links.

(3) Is centralized traffic control planned for a group of exchanges? Extended Area Service (EAS), that is, where free service is given throughout a group of exchanges, is becoming popular. This type of service requires larger trunking groups, which must be adequately provided before attempting to render this type of service. This may mean the expenditure of considerable amounts of money, raising the question of adequate revenue to compensate for this expenditure. These are some of the questions that must be answered.

(4) How will your service be affected by the inter-toll dialing plan? It must be understood that any channel that may eventually become part of the nationwide toll dialing system must meet the most rigid transmission and signaling requirements, and to a great extent carrier channels are preferred over physical circuits.

With multi-channel carriers becoming popular it is very important to have dependable physical circuits. It must be understood that carrier systems are essentially high frequency devices used to superimpose additional voice and telegraph channels over existing physical circuits. Therefore, physical circuits must be dependable if satisfactory carrier operation is expedited.



Case transposition bracket is assembled by placing insulators and bushings in position, sliding pin through bracket and insulator, and inserting cotter pin in proper position as shown above.

Because of the rapid development of multi-channel carriers and recent price reductions by the manufacturers, it becomes more important to develop open wire lines to their full capacity by building up carrier channels. In most cases, from one up to 16 channel carrier systems can be installed over a single open wire circuit by merely redesigning the transposition scheme. With this amount of circuit addition possible on open wire, it will be almost impossible, in the majority of cases, to prove in cable or microwave where an existing open wire lead can be built up with carriers.

It can be readily seen from the above mentioned items that a careful study of each case is necessary, showing the estimated cost figures, before a decision can be rendered as to the most satisfactory method of meeting the predicted growth.

To take a specific example, I would like to mention a recent request for toll circuits that was made by our traffic department in connection with the dial conversion of our Kingsport, Tenn., exchange on Jan. 9. This exchange of 15,000 stations was converted from common battery operation to dial and at the same time was connected to the inter-toll dialing network on a nationwide basis, which required a considerable increase in the over-all toll circuit requirements.

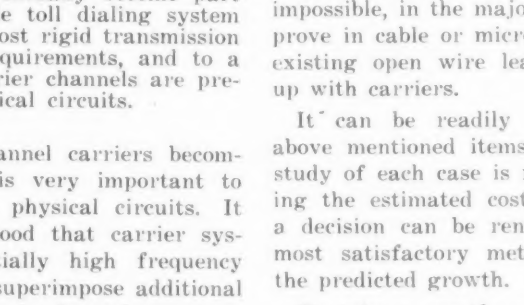
For the entire exchange, our traffic department furnished the following toll circuit requirements: Present, 6 before cut-over, 77 circuits; after cut-over, 99 circuits; 1955, 107 circuits; 1956, 120 circuits; and by 1964, 14 circuits. This information was used in determining the over-all toll equipment to be provided.

However, in order to determine the amount of outside toll plant to be provided, it was necessary to study the traffic estimate from a group requirement standpoint. This exchange is served by three major long-haul toll outlets. For this discussion only one of the toll outlets will be considered. This particular line, or toll outlet, consisted of two full arms of toll between Kingsport and Bristol, a distance of approximately 25 miles. This toll line also carries three additional arms of wire most of the way, serving a community dial office and also an airport along the way. The traffic department's toll traffic study, when applied to this particular line, indicated as follows:

Present	23 Circuits
At cut-over	37 Circuits
1955	41 Circuits
1956	45 Circuits
1959	55 Circuits
1964	65 Circuits

The above information was presented

(Please turn to page 34)



Case aluminum span-type transposition bracket.

★ ★ ★ IN THE ★ ★ ★ NATION'S CAPITAL

by FRANCIS X. WELCH — WASHINGTON EDITOR

Idaho commission charged with usurping management's judgment in Mountain States Telephone & Telegraph Co. case. Senate looks at UHF-VHF television problems. New York Central Railroad stockholders' fight presents lesson in democracy of the American corporation.

FOR A second time, a request by Mountain States Telephone & Telegraph Co. for a rate increase has been rejected by the Idaho commission. A court appeal appears certain. Setting the value of the company's Idaho investment at 21 million dollars (5 million dollars below the company's figures), the commission said that present rates are yielding on that basis slightly less than 6 per cent and that was a reasonable return. The company's state manager estimated that the rate of return was only about 3 per cent.

Most unusual features of the commission's opinion were the criticisms (because of increased prices) of the company's effort to install new and improved plant, as well as management's desire for conservative debt ratio.

On the first point the commission said that because of a lag in dial conversion the cost of adding new telephones is now over $400 each and management "has put no economic limit beyond which it should not go in building plant to accommodate new subscribers." The commission claimed that this resulted in older subscribers paying higher rates for new plant construction which does not produce additional revenue or adequate return except at prohibitive rates. The commission rejected the contention that one-third debt and two-thirds equity financing was desirable to attract new capital. The commission thought 45 per cent debt and 55 per cent equity would work out all right. The commission's action was taken on rehearing.

The original petition for a rate increase had been filed by Mountain States two years ago and denied about a year ago. Since that time the company has been collecting the higher rates under an injunction. Another interesting point which the commission decided adversely to the company's position dealt with the separation of intrastate-interstate operations for rate-making purposes. The commission found that the separations formula should be based on "peak" use rather than averaged over a test period. The commission stated:

"The toll plant is admittedly constructed to, and does, accommodate and handle this 'peaked' business, so that the proportion of the total plant engaged in handling the peaked use is the proportion available for interstate use during the rest of the 12-month period. Under the company's plan of averaging this use, the unused portion is not only taken out of service, but it is allocated or apportioned to intrastate service."

After applying such a separations factor to the total Idaho plant, the commission found that existing rates would enable the company to earn a 6 per cent rate of return on a net intrastate investment rate base, which included telephone plant in service, property held for future use, and material and supplies, less the allocated depreciation reserve.

All of these rulings of the Idaho commission are interesting examples of a regulatory commission apparently substituting its judgment for that of management on questions which are normally not within the purview of regulatory authority. Whether a company wants to go into debt or stay out of debt is generally understood to be a question for managerial discretion, subject perhaps to regulatory correction (by way of restricting dividend payout) in extreme cases of excessive indebtedness.

Again, whether a company converts from manual to dial, and when it decides to do so, and what it pays for the operation are, normally, management questions, except in rare or extreme cases of abuse of such discretion. This observer can well understand why the Mountain States general manager for Idaho could say that his company had "no alternative" but to appeal to the state supreme court.

This case is also a good example of regulatory lag—meaning delay of rate decision during a period of rapid inflation. It has taken this commission two years to say "No."

Senate Eyes TV Problems

The way the "ultrahigh frequency" (UHF) television stations are being kicked around these days by the competition is a crying shame. That is the way FCC Commissioner Frieda Hennock feels about it. In fact, she even indulged in a few tears before the Senate Interstate Commerce sub-committee, which is investigating the plight of the UHF stations. What moved the attractive lady commissioner to make a few ladylike dabs with her handkerchief, however, was the way the senators put the pressure on the commissioners to get their TV stations licensed in their home towns or home states.

"I will have to take my hair down and blame the Senate as much as the commission," she said. She referred to senators who call up and say "hurry up and give us television service . . . and give it to us by tomorrow."

What the sub-committee was mainly concerned with was a difficult situation which should be of collateral interest to telephone companies, as well as the TV licensees, set manufacturers, etc. Your correspondent has previously discussed in this department the way the ultrahigh frequency TV stations are falling behind in the competitive race with the older and more conventional "very high frequency" (VHF) stations.

Comparatively few of the UHF stations, which were licensed after the Korean war control freeze was lifted,

are operating extensively, and some of them have thrown up their licenses because most receiving sets now in the hands of the public cannot even get UHF programs. Acting Chairman Hyde of the FCC told the sub-committee that the basic problem is to sell the public and the set manufacturers on the importance of distributing sets which will receive UHF programs. TV pioneer Dumont warned that monopoly will result in television and the consumer goods it advertises unless the government acts to put UHF stations on an equal footing with VHF stations. UHF broadcasters suggest a freeze on TV stations not yet completed and other allocation of commodity rights and network programs, so as to put the UHF stations in a better competitive position.

Both Acting Chairman Hyde and Commissioner Hennock virtually confessed—looking at the subject with the benefit of hindsight—that a basic mistake had been made in setting up television controls. There were 124 UHF stations on the air as of May 15, against 250 VHF stations, Mr. Hyde told the committee. But, so far, 10 UHF stations in various parts of the country have been forced off the air, and more than 50 potential UHF station owners have turned in their construction permits, he said.

There are 70 available channels in the ultrahigh band against only 12 in the crowded VHF band. FCC's policy has been to rely on growth of UHF stations to spread TV to the still-blacked-out areas of the nation. But because VHF stations are far more powerful at present and because many more people own sets that will receive VHF broadcasts only, the UHF stations are having trouble almost everywhere they exist.

Commissioner Hennock had a five-point program for reform, but it is very doubtful if Congress would resort to such drastic action, which might prove highly unpopular politically. Her plan would be to freeze all new allocations of VHF channels and all new construction permits for VHF stations. But she would cut back the power of VHF stations to the approximate strength of UHF stations in the same area; and she would prevent overlapping of broadcast coverage. Finally, she would have Congress pass a law which would put TV and radio networks under control of the FCC so that they could be forced to make network programs available to UHF stations.

This question of networks brings the subject close to home for the telephone business, or at least the Bell System. Bell disclosed last week that 300 television stations all over the country are now receiving TV network service via Bell System facilities. The Long Lines Department of American Telephone & Telegraph Co., which provides transmission facilities that tie radio and telephone systems as well as television into national networks, said the interconnection brought the roll call on network TV service to 191 cities in the United States. More than 54,000 channel miles of coaxial cable and radio relay facilities are being used to provide these cities with network television. There are now about 380 TV stations on the air in the United States. These stations, located in some 250 cities, broadcast to an estimated potential audience of 109 million.

It goes without saying that anything Congress or the FCC can do to make the UHF TV licensees stay in business or grow will be that much more business for the telephone industry handling the network services. But it is going to be a tough nut to crack. Acting Chairman Hyde thinks that with time, patience, and encouragement the set manufacturers will be able to sell the public on the idea of buying sets capable of receiving both UHF and VHF programs.

The main trouble, however, is the established backlog of millions of sets, now being operated, which cannot receive UHF. Their owners feel they are being adequately served through as many as four local VHF stations. (This is the situation in New York, Washington, and other metropolitan areas.) It is going to be hard to sell these people on the idea that they ought to buy a new set, or pay a substantial sum for an expensive conversion operation, just to get the same program via a UHF station.

The fact that all stations are competing so furiously for the advertiser's dollar, and the fact that color television (requiring so many more of those dollars) is just around the corner, complicates the commission's task. This is one job that Congress would be very happy to leave to the commission, if a solution were in sight.

Battle of the 20th Century Limited

Telephone company investors can afford to look with interest on the recent bitter war for control of the vast New York Central Railroad. It reached its climax last week (May 26) as 2,000 shareholders assembled at the regular annual meeting in Albany to vote shares and proxies on rival slates of directors.

The conservative New York bankers and investors and the Wall Street element favored the incumbent management, headed by William White. Those who thought it was time for a change voted in favor of a new board sponsored by a Texas oil millionaire group headed by Robert R. Young, who used to run the Chesapeake & Ohio Railroad.

The charges and countercharges in the battle for proxies reached an emotional pitch equivalent to any political election campaign. The White management promised better earnings through more economic and efficient operations and schedules. The Young faction accused the White management of fuddy-duddy methods; and allowed as to how the Texas boys could show those Yankees "up North" how to run a railroad and make it pay—right in their own Yankee state of New York! So, while the band played a song, which could be entitled either "I've Been Working on the Railroad," or "The Eyes of Texas Are Upon You," the stockholders voted and the battle of the New York Central became history.

For telephone and other investors in American industry, there is a great lesson in all this which should not be lost. It is that the American industrial corporation is a democracy in the truest sense of management's responsibility to ultimate ownership. We have read and heard a lot of leftish nonsense, from time to time, about the "soulless corporation." It generally comes from public ownership zealots, anxious to peddle some brand of creeping socialism or other governmental control. During the thirties, it was considered smart and intellectual to talk about the "30 leading families," who allegedly exercised monopolistic control over the entire American economy. The old electric utility holding companies were condemned as "the power trust," although the largest of them (Electric Bond & Share) at the peak of its size, never controlled more than 11 per cent of the industry's operations. The Bell System has likewise been criticized as a self-perpetuating dynasty of management, with headquarters at the AT&T in New York, and with voting securities so numerous and so scattered that no stockholder revolt could ever seriously challenge the management.

The battle of the New York Central showed, more than anything else, that existing management *can* be ousted, if enough stockholders think that they would be better off under a different management. In other words management, whether it be of a giant utility corporation, such as the New York Central or the AT&T, or whether it be of a small telephone company or non-utility corporation, *can* be thrown out!

The important thing to keep in mind

(Please turn to page 36)

THE PLANT MAN'S Notebook

by Ray Blain, Technical Editor

IN A TALK at the Plant Conference of the recent Ohio Convention titled: "A Plant Man Views New Equipment," William Reichel, general plant supervisor of the Ohio Consolidated Telephone Co., Portsmouth, made the following appropriate remarks on public relations in closing his paper:

"Our progress in equipment and methods has been great but we have not increased the value of our product in the eyes of our subscribers equal to our progress.

"Why should plants be charged with this apparent failure? Because we should know better than anyone else the increased value of new methods and equipment, no matter how small or slight.

"Did we make sure this increase was pointed out to our personnel, and did we furnish all information of this value to those charged with advertising and public relations? Did those of us in the small companies where many functions are combined into one, make sure that this increased value was pointed out to the subscriber?

"It has been proved that Americans are mechanical and electrical minded, and what better examples can be found than those common to our work. From the largest and most complicated automatic network to the simplest magneto system, there is equipment which is interesting. Let no opportunity, from fairs and public gatherings, up to the subscribers paying their bills in your own office, pass without pointing up this progress.

"If you don't toot your own horn, nobody else will. We plant people know, and let's make sure others do, that we have kept and will continue to keep, pace with progress."

• • •

We have heard numerous complaints lately from subscribers who have had their telephone numbers changed and then the old number has been reassigned to someone else before a new telephone directory was published. We had thought that in such cases it was customary to leave the old number on intercept for a considerable length of time.

However, it appears that in many cases today, due to the shortage of central office facilities, this practice is not being observed. As a result, the new customer often will be annoyed by answering "wrong number" calls from individuals desiring to talk to the people who originally were assigned his number.

In one case known to us the telephone company at fault called the party with the new number and requested that he inform all his friends that his number had been changed. Naturally, this offended the customer for he had done all this but still the frequent calls to the old number were being made by out-of-town friends and business concerns and others who referred to the directory for the number.

Another case which was brought to our attention involved the changing of a number which was immediately reassigned to a party who was building a new house by working on it evenings and weekends.

This party was seldom within hearing of the telephone and as a result the party with the new number received very few calls for several weeks. They later obtained a refund claiming that they had only one-way service.

Then, after the new house was completed, the telephone company placed a sign near the telephone stating that when anyone called for Mr. Blank's residence they should be advised to call number so and so. Certainly, such an arrangement did not please either customer.

It is realized that with the current rapid expansion of the telephone industry, the central office facilities of most companies are seriously overloaded. However, it would appear that every effort should be exerted to avoid the reassignment of numbers until a new directory has been published. With the present day large volume of changes in the average exchange perhaps the publication of new directories at shorter intervals would be warranted.

• • •

The writer recently spent a most enjoyable day going through the Hawthorne plant of the Western Electric Co. in Chicago. First we visited the wire mill and observed copper bullets as they were being reduced to small gauge wire and used for cable conductors. We also saw aluminum rods being reduced to cable conductors. The cable plant where we watched the manufacturing of stalpeth cable was equally interesting. We also observed the manufacture of the carbon deposit resistor and the wire spring relay. This relay which is assembled without screws is used in the No. 5 crossbar system.

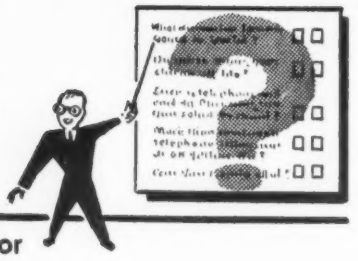
The second day was spent in the company's Indianapolis, Ind., plant where the 500-type telephone is manufactured for the Bell System. An average of over 13,000 telephones was turned out by this plant on each working day during 1953.

The efficiency of this factory is amazing. The overhead conveyor system not only contributes to efficiency, but also reduces confusion to a minimum.

For example, the conveyor that carried the case for the 500-type telephone is estimated to be about 2,500 feet in length and runs continuously. The cases are hung on the conveyor at several points where they are removed from the molds. They are then removed from the conveyor at several points required in the assembly of the telephones.

We were accompanied on this trip by C. E. Budd, of the New York office of the Western Electric Co. The officials, engineers and workers at the various plants proved to be thorough and patient in their explanation of the various manufacturing processes. As a result of the able assistance of these men we were able to acquire a wealth of useful communication information for future reference.

PLANT MAN'S QUIZ



by RAY BLAIN, Technical Editor

Q. What is the so-called five pair rural line cable and where is its use recommended?

A. One cable of this type consists of five neoprene jacketed pairs twisted around a steel core. Each conductor is No. 20 hard copper with teleplate process, brass-overlead plating, and high dialectric strength Buna S insulation to a nominal diameter of .080".

It is tough neoprene jacket to a nominal outside diameter of .30 inches. Single conductors are paired. The five pairs are twisted around a core of 1,800 pounds breaking strength galvanized steel wire. Adjacent pairs have varying lays to avoid crosstalk. The outside diameter of the cable is approximately .600 inch.

This cable is recommended for use on new installations or for use in adding additional capacity to an existing pole line. Its low initial cost, light weight and ease of installation makes it desirable for rural line use. This cable may also be used on crowded poles where space is not available for the installation of additional cross arms.

• • •

Q. What is the decimonic ringing system?

A. This system derives its name from the 10-cycle spacing between the ringing frequencies which are 20, 30, 40, 50 and 60 cycles. This system claims freedom from cross-ringing, elimination from frequency drift, and reduction of operating costs. The Model K-5 Sub-Cycle operates from the 60 commercial power and has no moving parts. The ringing frequencies are positively locked with the 60-cycle supply frequency, so that the bells once adjusted to the proper frequency are always operated efficiently.

• • •

Q. We are planning a new local exchange cable distribution system and will appreciate some advice as to whether it is considered necessary to install cable stubs in all manholes.

A. We do not believe that cable stubs will be necessary in all manholes. It is our opinion that they should be provided in all locations where it is anticipated that branch cables or distribution terminals will be required at a later date.

Stubs should also be provided at all points where it may be necessary later to change counts so that the cable can be used at higher efficiency. If a stub is provided, then the count may be changed or additional distribution cables installed without opening the sleeve on the main cable.

It is usually considered good engineering practice to arrange stub cables in such a way that not more than three branch cables will be connected to one stub. The splice should also be planned so that not more than two cables will enter the sleeve at either end.

Where one stub must serve more than three branch cables, a second stub should be taken out of the first stub and the branch cables arranged so that neither stub will have more than three branches.

The pairs in a stub cable should all be clear-capped. This should be done in the same manner as when pairs are left dead in a splice. The conductors should be at least 12 inches long. The number of sleeve banks to be used will depend upon the size of the cable and the size of the sleeve used to cap it.

• • •

Q. Will it prove desirable and economical to use cable terminals of 6-pair in a local distribution system?

A. In our opinion, this will depend entirely upon the nature of your distribution. If the houses in a certain area are located so that two or three lines only will be connected to each terminal, then perhaps the 6-pair size will prove economical.

It must be remembered, however, that an 11, 16 or 26-pair terminal will cost very little more than a 6-pair and the larger sizes provide greater flexibility if properly multiplied.

• • •

Q. In laying out a new rural line, is it considered necessary to measure each span length accurately by the use of a tape line?

A. Regular spans should be accurately measured so that they will be uniform. Such measurements may be made with a tape or a distance measuring wheel. These wheels are pushed along the ground by means of a handle and record the distance in feet and inches.

However, if the line is constructed over uneven terrain, special spans must be longer and shorter than the average so that proper ground clearance may be obtained.

Measuring wheels may be procured from your telephone supply house.

• • •

Q. Will it be necessary to provide special ringers for telephones to be used with decimonic ringing?

A. Multi-frequency ringers which will provide selective ringing in five frequencies for each of the harmonic, decimonic and synchromonic series, are now available.

While tuning condensers are added for certain ringer frequencies, they form an integral part of the ringer unit. The ringers are completely adjusted at the factory to ring at the designated frequency.

It is claimed that this ringer has excellent tone quality. In the past, some of the multi-frequency ringers have had poor tone quality because large resonant weights on solid arms were used to strike the gongs. This new ringer makes use of a small clapper weight on a flexible arm to strike the gongs and a separate resonant weight on a solid arm to obtain resonance. The formed aluminum resonator shells mounted behind the ringer gongs have also been retained to increase the volume of the fundamental gong tone.

It is further claimed that the superiority of tone and volume is increased by mounting the resonant chambers in the vertical rather than the customary horizontal plane. Uniformity of the ringing tone quality is achieved for all frequencies in the series because only the small clapper strikes the gongs.

Since it has been possible to keep the average ringer impedance very high, the current drawn by these ringers is very low. The average impedance at 400 cycles is 100,000 ohms and the average impedance at 1,000 cycles is approximately 400,000 ohms. It is also claimed that these ringers will operate at voltages 40 per cent below the normal ringing voltages. It is possible to use up to ten ringers bridged on one line. The ringers have undergone extended life tests and have passed a minimum of 200 hours continuous ringing at their resonant frequency.

V V

"Men are seldom blessed with good fortune and good sense at the same time."—LIVY.

ILLINOIS INDEPENDENTS

Urged to go After Toll Business

By R. C. RENO

"WHILE we are shifting from a hard goods economy and an emphasis on soft goods, there has been a considerable pick-up in the demand for various services and the telephone industry should go out and get its fair share of this business," Ray J. Alter, president of the Illinois Telephone Association, stated in opening the association's annual convention, held Apr. 26 and 27 in Peoria.

Mr. Alter noted that the rate of increase in new stations has dropped off in recent months. However, he said, the industry still is experiencing an over-all gain in stations. He emphasized that this is an indication that telephone companies are catching up with the demand for exchange service.

However, there is a definite softening up in toll service. The Bell System has already formulated plans and, in fact, it has started an aggressive campaign to sell toll service. The Independent field must do the same, Mr. Alter declared.

Speaking of the future of the telephone business, Mr. Alter said:

"Now let's think a little bit about the future. We have a whole host of responsibilities. I think our primary consideration and our basic responsibility is consideration and fair treatment of our customers, and that implies good service and all the things that go with it. . . .

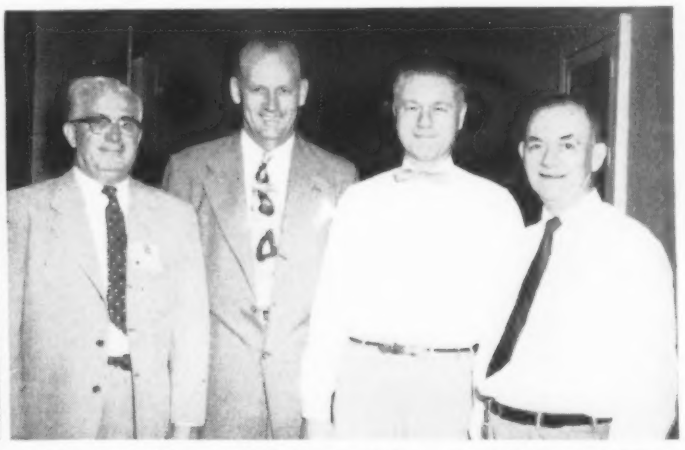
"Another thing that we can do is to recognize the problems of our neighbors. We've tried to encourage it through the activities of our small company committees. However, in addition to their work each and everyone of us can help. Our next door neighbor may need a little advice. He may need a little counseling. He might just want to sit down and talk his problem over with us. We should try to enrich our personality by going out and helping the other fellow just a little bit. It will not only help us, but it will help the whole industry.

"Do something to improve your own service. No matter how large or how small you are, or how good you might think you are, there is always something that each of us can do. The fact that you may be pinched a little bit, or that you may be small, is no excuse either.

"There is an old saying which goes: '*No matter how poor you are, you can at least be clean!*' Soap and water doesn't cost much. By like manner, good housekeeping habits do not have any high dollar tags on them. It is just a way of life, a way of thinking and it is a program carried into action. Clean up your exchange quarters. Invest a few dollars in a little bit of paint, wash the windows, be a good housekeeper. You'll be surprised what a reaction it has on your customers. It can't help but be favorable."

In his annual report, Association Counsel Ben B. Boynton stated that certain areas of the state, vacated by companies that have "folded up and quit," still lack telephone service. Terming this one of the many problems facing the telephone industry, Mr. Boynton said:

"Every person desirous of telephone service and willing to pay standard



LEFT PHOTO: Traffic conference hostesses at the Illinois convention (left to right): MRS. MARIE SULLIVAN of Galesburg, Ill.; MILDRED ELLIOTT of Kewanee, Ill.; MARGARET McLAIN of Bloomington, Ill., and MRS. DORIS LEGAZ of Peoria, Ill. RIGHT PHOTO (left to right): J. G. HARDY of Springfield; DON ANDERSON of Geneseo; A. T. RENN of Chicago; and R. B. THOMAS of Springfield.

rates should get it. But many puzzling questions arise in trying to reach that goal. The unthinking may say it is simple; simply have a large telephone company that is near that territory take it over. There are two main obstacles in the way of this course.

First, if such company were to take over this additional territory it probably would have to curtail its program of construction and improvements in its own territory that needs construction and improvements to adequately serve its own people. Service to present subscribers should not be impaired nor its betterment curtailed in order to take over additional territory.

"Second, a telephone company cannot be compelled to serve a territory which it does not hold itself out to serve. Since it can be compelled to render adequate service in its own territory it should not take an additional area unless it is able to give adequate service, not only in its own territory, but also in the additional territory it takes over.

"A solution must be found. It is unthinkable that conditions may be allowed to exist year after year where there is either no telephone service of any kind, or only the poorest kind of service available.

"Looking back over the past 40 years, I do not see any one formula for solving the problem. I believe each situation must be studied, both by itself and in connection with adjoining companies and communities.

"In some instances, mergers of several small companies may increase the size to the point where the merged company can obtain the necessary institutional financing to make such construction and improvements as are necessary to give adequate telephone service. In other cases, by a campaign of enlightenment, showing (the public) what is required to obtain the necessary desired telephone service, the financing and work can be done on a community basis. In all cases, the first step is to determine what should be done in order to furnish adequate telephone service in the community in question and the next step is to determine the most practicable way of accomplishing that result."

Shown at the speakers' table during the Illinois convention are, left to right: FRANCIS X. WELCH, Washington editor of TELEPHONY; L. F. ROBERTS of Bloomington, Ill.; B. W. SAUNDERS of Springfield, Ill., and RAY J. ALTER of Galesburg Ill.

The activities of the association's committees were outlined by Secretary J. G. Hardy in his annual report.

He reported that the accounting committee had cooperated with the Illinois Commerce Commission in revising the commission's annual report form for Class A and B telephone companies.

The commercial committee, he said, had worked with the commmission in helping it obtain compliance with the commission's order requiring telephone companies to file exchange boundary maps; and also in revising the commission's order establishing rules and regulations governing the credit of applicants and customers of utility services.

The secretary reported that the plant committee had held two one-day clinics during which various plant problems and new products and techniques were discussed.

He also told of five district meetings held during the past year which attracted an attendance of 602 representatives from 95 Independent companies.

Secretary Hardy urged all companies having financing, rate and service problems to request the assistance of the association.

The activities of the Illinois association's general and district Small Company Assistance Committees were described by D. F. Anderson of Geneseo, chairman of the general committee. He listed the duties of the committees as:

(1) Stimulation of small company managements' interest in the efficient and economical operation of telephone properties.

(2) Encouragement of the consolidation and merger of small units of the industry with the view of forming stronger self-supporting systems.

(3) Formulation of a program which will encourage small telephone companies to help themselves.

(4) To make available authentic and up-to-date information on telephone practices and methods.

(5) To provide its members means and opportunities for the interchange of ideas, knowledge and experience to aid in the solution of the problems of the science and art of the telephone industry.

(6) Promotion and protection of the welfare of the industry.

Mr. Anderson stated that in the short time the committees have been active, 130 small telephone companies have been assisted in connection with reorganization, financing plans, filing of new rate schedules, improving outside plant and central office, establishing exchange boundary lines and improving accounting procedures.

As of the end of March of this year, committee members had conducted 338 interviews with representatives of small companies in Illinois, Mr. Anderson reported.

In an address entitled "The Time Has Come to Talk of Many Things," L. F. Roberts of Bloomington, assistant

Photographed at the Illinois convention were, left to right: L. F. ROBERTS of Bloomington, Ill.; A. G. KIESLING of Madison, Wis.; E. H. FRENCH of Chicago; DOUG SMITH of Chicago, and WALTER DAKIN of Madison, Wis. (Photos taken by Fred Addis of Springfield and furnished by Illinois Telephone Association.)

to the president of the Illinois Telephone Co., warned that the time has come for Independent telephone companies to tell the public their stories in order to enhance their position in the court of public opinion.

He pointed out that customer opinion surveys in various areas and localities have emphasized three things:

(1) That the great bulk of telephone subscribers are totally ignorant and uninformed about the telephone industry, how it operates, and of the miracles it performs.

(2) That the majority of these people are thirsty for knowledge in this respect, and that, when given this knowledge, they

(3) Lose much of their antipathy and belligerency toward rate increases, and toward fancied or real service inadequacies.

He continued:

"I would like to commend to your thinking just a few 'ways,' perhaps two or three of the chief methods by which we can best, I think, get our message across, and accomplish thereby our primary purpose—that of educating public opinion.

"With all due respect to such media as advertising, publicity, bill inserts, letters, displays, exhibits, etc., — and don't for one moment discount their effectiveness—I personally believe that more emphasis could well be given to three avenues of approach which, in the order of their importance and effective results, are:

"(1) Employe contacts with customers.

"(2) Central office visits, or 'open houses,' as we sometimes call them, periodically held and carefully planned.

"(3) Public speaking activities before service clubs, trade associations, and other civic and social groups."

The Illinois convention drew many early registrants.

In closing Mr. Roberts said:

"And when you think about it what a story we have to tell! What a story this industry has. If we want the public on our side, all we have to do is simply tell the truth.

"And what is the truth?

"The truth is, that few yet realize that whenever they place a telephone call they are using the most complex machine ever devised by man. Every telephone is actually a small part of a vast, nationwide network of wires, cables, and central office switching equipment that required billions of dollars and millions of man-years to build.

"The truth is, of course, that no business or industry has written a more glorious chapter, or made a more outstanding contribution to human betterment and the perpetuation of the American way of life than have the telephone companies of America, both Bell and Independent.

"The truth is, of course, that nowhere in the world today, except in America, can you talk so easily by telephone, whether you live in a crowded metropolis, or in a relatively isolated rural area, or whether your call be to the grocery store down the street, or to some point across the continent.

"The truth is, that the growth and progress of the telephone industry has been an amazing saga of man's inventive genius. It has been a story of high courage, of unfailing vision, and enduring faith—a story that ranks high in the annals of all human achievements, and of which you and I, and all the countless thousands of telephone men and women, who, over the years have contributed to its never-ending drama, may well be proud.

"The truth is, that the telephone, considering the service it performs, would be cheap at twice the price charged by any telephone company in the land today!

"Now you and I know all these things; we know them well and we feel them strongly, but do our employes and do our customers know them? What do we do to *make sure* that they know them?

"Yes, the time has come for us to talk of many things."

Samples of Advertising and customer relations material used by....
ILLINOIS TELEPHONE COMPANY
"THE TIME HAS COME TO TALK OF MANY THINGS"
Pictorial Tour of
Bloomington Normal
Telephone Exchange
CENTRAL OFFICE VISITS LEAD TO BETTER UNDERSTANDING
CUSTOMER Information
EMPLOYEE Information

L. F. ROBERTS of Bloomington, Ill., specker at Illinois convention with display of advertising material used by his company, the Illinois Telephone Co.

"The Washington Outlook for Public Utilities," was the title of an address presented by Francis X. Welch, Washington editor of TELEPHONY. Mr. Welch's address appeared in full in the May 8 issue of TELEPHONY.

The convention concluded following addresses by two non-industry speakers —Lucile LaChapelle of Itasca, Ill., and Tom Collins of Kansas City, Mo., publicity director of the National City Bank and Trust Co. of that city.

The convention re-elected the following directors: Gordon Aller of Chicago; Walter Dakin of Madison, Wis.; C. E. Frey of Troy; Russell Logue of Casey; C. F. Melick of Eureka; W. R. McGrew

(Please turn to page 38)

The new Wisconsin association board of directors includes, front row, left to right: A. H. BOWDEN of Almond; L. M. LAMKINS of Manawa; J. F. BENJAMIN of Cumberland (newly elected vice president); B. H. PIEPMEIER of Black River Falls (newly elected president); T. H. SANDERSON of Rio (retiring president); W. E. LAWTON of VIROQUA (treasurer), and T. H. MORAN of Madison. Back Row: RAY J. RIORDAN of Madison (secretary); H. G. ALLEN of Madison; WYMAN W. WISWELL of Elkhorn; J. E. WELSH of Mt. Hope; H. P. SIEBKEN of Madison; H. B. FLOWER of Wisconsin Rapids; PAUL R. PARSONS of Rhinelander; G. F. MOSER of Sharon; G. A. RUTENBECK of Milwaukee; KARL MESS JR. of Phillips, and D. E. PETERSON of Medford. Absent: R. M. KEATING of Wausaukee, and E. B. SAMP of LaCrosse.

Wisconsin Convention Features Growth

by Dan S. Fargo

WISCONSIN State Telephone Association's 44th annual convention drew a record 419 people to Madison on May 5 and 6. A well-balanced program was presented; it included association and USITA progress reports; a question and answer panel discussion; public relations ideas; and talks on extended area service and microfilming.

Association President T. H. Sanderson, Rio, called the meeting to order and introduced the mayor of Madison, George Forster, who welcomed conventioneers.

Mr. Sanderson, in his annual report, stated that in the last two years active membership in the association had risen 53.8 per cent, and associate membership 67.7 per cent for a composite total increase of 57 per cent. Also, he said, during the past two years 284 representatives of operating companies had attended the four area clinics put on by the association.

Mr. Sanderson took note of the telephone industry's 10-year progress in Wisconsin, and he termed it "outstanding." He said, "During the 10-year period from Dec. 31, 1942, to Dec. 31, 1952, the number of telephones in service in the state of Wisconsin has increased from 612,048 to 1,054,704, an increase of 72.3 per cent, and our telephone plant investment has increased from $107,700,000 to $234,449,000, an increase of 117.7 per cent. I have not the final figures for 1953, but they will make a similar showing.

"Further, from 1939—which we consider as a normal pre-war year—to Dec. 31, 1953, telephone rates have increased only 65.66 per cent, while the cost of living has gone up 92.8 per cent, the price of food 138.9 per cent, (and) the weekly wages in Wisconsin 179.10 per cent. . . ."

The president of the United States Independent Telephone Association, Warren B. Clay of Hutchinson, Minn., brought "Greetings From USITA." Mr. Clay reminded his listeners of the greatness of the Independent industry — 5,100 companies, representing a 1-billion-600-million-dollar investment; serving 11,000 communities or two-thirds of the geographic area of the United States; employing 100,000 persons and having 150,000 stockholders; and a total of 9 million telephones producing 500 million dollars in revenues annually.

Mr. Clay listed the industry's best opportunities for selling more service. The leading ones mentioned were: (1) Greater use of toll service; (2) more extension telephones; and (3) service to pipe line companies. He said, too, that Independents should sell themselves and their service constantly to their present subscribers, the state commissions and the general public. Mr. Clay observed that informed subscribers tend to be sympathetic to rate raise applications.

In telling of USITA legislative activity, he reported that President Eisenhower on Apr. 27 had signed the

Rogers-O'Hara Bill, exempting intrastate telephone companies which use radio-telephone, from FCC jurisdiction.

Next, a five-member panel discussed a variety of industry questions. James R. Durfee, chairman of the Wisconsin Public Service Commission, was moderator. Members of the panel were: H. J. O'Leary, chief, rates and research, the Wisconsin commission; Ralph S. Butler, assistant chief, accounts and finance, the Wisconsin commission; B. H. Piepmeier of Black River Falls; L. R. Gilbertson of Tomah, and G. A. Rutenbeck of the Wisconsin Telephone Co.

Some of the questions the panel discussed, were:

(1) In rural line construction, where should a company draw the line on free extension of lines, at 1/3 or ½ mile?

(2) Is there any trend developing in the matter of rate levels; i.e., a trend toward more rate increases or toward rate decreases—any new inflationary factors over 1953?

(3) Will cessation of the Korean War affect employment in the Wisconsin telephone industry?

(4) Rates for the same grade of service often vary from one company to another. What is the explanation?

(5) Upon what factors should the compensation of management be based?

(6) Under what circumstances should a company:

(a) Move a boundary line to permit a customer to receive service from another exchange.

(b) Insist that a customer take service on a foreign exchange basis.

(c) Provide extended area service.

(7) What should the ratio of debt capital to equity capital be?

(8) Should rates for rural service continue to be subsidized by other classes of service?

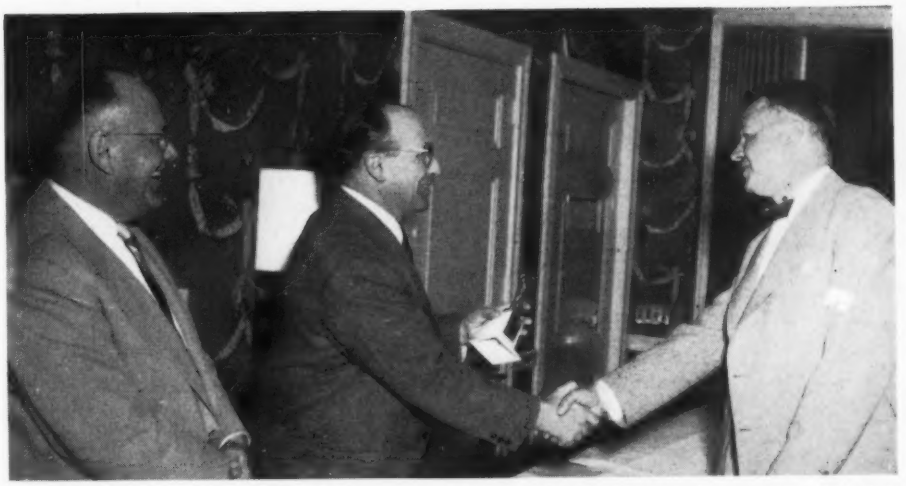
(9) What can be done about the fact that some interstate rates are lower than some intrastate rates for the same or longer distances?

(10) What help can the state telephone association give to the small company?

Following adjournment, the Badger State Chapter of the Independent Telephone Pioneer Association held its annual luncheon.

W. E. Lawton, Viroqua, treasurer of the Wisconsin association, gave his annual report to open the afternoon convention session.

"Communications Teaching Aids" was the subject of a talk by H. S. Day, public relations supervisor of the Wisconsin Telephone Co. Reminding his listeners that grade school pupils cause a certain part of party line usage problems, calls to information, and wrong dialing of numbers, he told of his company's work with grade school teachers to reduce the occurrence of these problems.



H. F. SCOTT (right) of the L. M. Berry Co. receiving a trophy for lowest golf score from WARREN B. CLAY, president of the United States Independent Telephone Association. C. N. GOULET of the Wisconsin Telephone Co. and chairman of the golf party, looks on.

Part of the audience at a convention session. (These Wisconsin convention photos were taken by Thomas M. Segerson, the editor of the General Telephone Co. of Wisconsin *News.*)

Mr. Day said it was essential to know the teachers' viewpoints. His experience has shown that the information furnished teachers must be:

(1) Free from what teachers and principals regard as propaganda.

(2) In line with sound teaching principles.

Discussing industry problems are (left to right): T. F. MILLER of the Wisconsin Telephone Co.; K. J. JACKSON of the Wisconsin Public Service Commission, and W. W. WISWELL of Elkhorn.

(3) So useful as to compel use over and over again.

(4) Must be reasonably low cost, and

(5) Must show the improvement in local telephone service.

Four ways his company has carried out a program guided by the above five points, were listed by Mr. Day as follows:

(1) Equipment loans to grade schools for 30 days—for example, a simple telephone requiring no tools for disassembly.

(2) Visits to the telephone company —hosts must prepare by simplifying their language so that they will avoid talking over their guests' heads.

(3) Visits to grade schools by telephone men—a lineman, for instance, to demonstrate all the gear in a telephone truck, to climb a pole and to talk safety.

(4) Availability of telephone company representatives scattered around the state to be speakers or to furnish movies or other supplementary tools.

Other reasons for teaching children how to use the telephone, Mr. Day said, include (1) ability to use it right in an emergency, and (2) the fact that sometimes children teach their parents how to use the telephone better.

Ralph S. Odegard of Menominee Falls,

(Please turn to page 38)

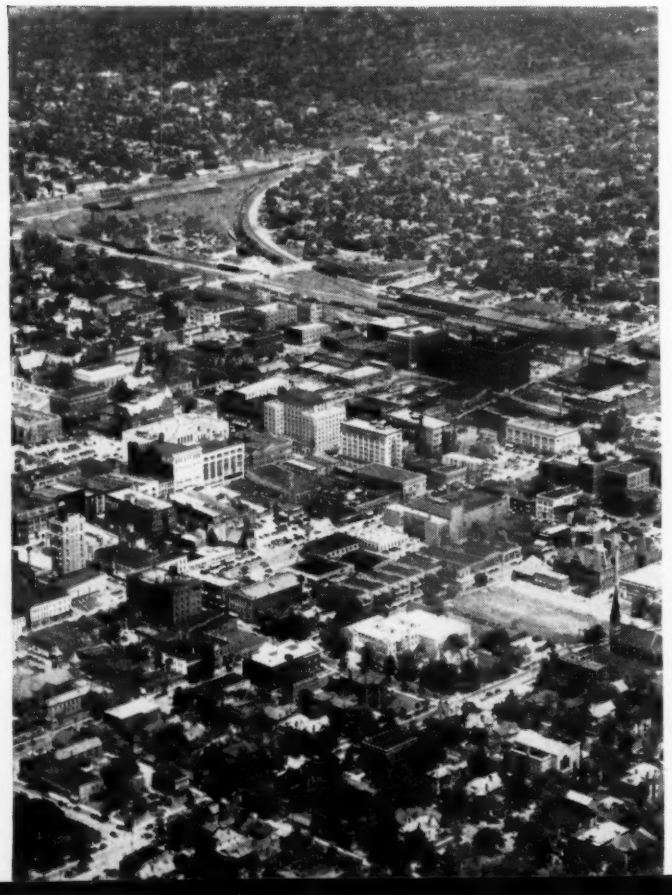
Four types,
to meet <u>all</u> needs!

for the metropolitan network using directors, SATT Type "A": Director selects regular or alternate route for traffic to neighboring areas; call is automatically extended to called party. Subscriber making short-haul call dials only the called party's directory number; calling station directory number is automatically identified—on up to five-party lines.

for the large central exchange or medium-sized multi-office network, SATT Type "B": Includes Transender (register-translator-sender). Subscriber dials "access code" of two or three digits, then simply dials called party's directory number (or area code *and* directory number, on long-haul calls). Calling station directory number is automatically identified—on up to ten-party lines.

for smaller systems where no operators are available, SATT Type "C": Subscriber dials SATT "access code," his own directory number and called number. Calling station directory number is automatically verified.

for smaller systems where operators are available, SATT Type "D": Subscriber dials only SATT "access code" and called number. Operator asks his number and then records it in SATT Ticketer. SATT then extends call automatically.



Strowger Automatic Toll Ticketing provides automatic short-haul toll ticketing *now*— with equipment that may readily be expanded to provide for nationwide customer toll dialing when it comes. SATT owners face the future confidently; they *know* their investment is safe.

SATT:

"sized" for you, easily readied for nationwide customer dialing

"We've planned for the future!" That's the confident outlook purchasers of Strowger Automatic Toll Ticketing take toward nationwide customer toll dialing. Their equipment is planned so that it may readily be expanded to meet its requirements without extensive alterations; they *know* their investment is safe!

Why? Because all SATT systems employ the same *basic principle*—providing for storage, translation, and re-transmission of dialed information either in the initial installation or at any time in the future. Thus, they can be easily expanded when it is required to translate area and exchange codes into routing "directives" (consisting of regenerated pulses of any kind needed) to select regular or alternate routes to control switching points (csp) of the nationwide customer toll dialing network.

There's a SATT system that's just right for *your* toll operating requirements. SATT has been operating successfully for years with step-by-step, panel, and crossbar networks in California and Illinois—so when you specify SATT you know you're buying equipment thoroughly proved in actual commercial use! Whatever your problems in toll ticketing, you may be sure we've already met them! Write for informative Circular 1809T today.

AUTOMATIC ELECTRIC

Originators and Developers of the Strowger Step-by-Step "Director" for Register-Sender-Translator Operation . . . Machine Switching Automatic Dial Systems

Makers of Telephone, Signaling and Communication Apparatus • Electrical Engineers, Designers and Consultants

Distributors in U. S. and Possessions: AUTOMATIC ELECTRIC SALES CORPORATION
Export Distributors: International Automatic Electric Corporation
1033 West Van Buren Street, Chicago 7, U. S. A.

REA Approves Seven Rural Loans

Rural Electrification Administration approval of $4,785,000 in loan funds to extend and improve telephone service in rural areas of Illinois, Minnesota, Wisconsin and Washington, was announced on May 18. Details of the loans follow:

East Otter Tail Telephone Co., Perham, Minn., on May 6, $301,000 second loan to this borrower.

These loan funds will be used by the borrower to construct facilities, including an additional central office and 154 miles of line, to serve 258 subscribers not included in the first loan. In addition, the funds will cover increased construction costs incurred since the original loan of $353,000 was approved in April, 1952.

The borrower plans to acquire the telephone properties of the Dent-Star Lake Telephone Co. adjacent to the present operating area. These facilities are now serving 214 subscribers. The Dent central office will be converted to dial, 126 miles of the acquired line will be rebuilt and 28 miles of new line added.

The two REA loans will enable the company to serve 1,450 subscribers in Otter Tail and Becker counties. Since the original loan was approved, the first section of the system, served by the Perham central office, has been cut over to dial and about 500 subscribers are now connected up in that vicinity.

Royale Arvig is president of the East Otter Tail company.

* * *

Richland-Grant Telephone Cooperative, Inc., Blue River, Wis., on May 11, $80,000 second loan to this borrower.

The loan will be used to finance the construction of 33 miles of line and other facilities to serve 46 subscribers who were not included in the first loan. In addition, it will cover increased construction costs incurred since the original loan of $244,000 was approved in November, 1952.

With the two loans, the Richland-Grant cooperative will be able to serve a total of 627 subscribers, including 222 rural families not now served. Central offices for the system will be located at Boaz, Blue River and Sabin.

The completed system will consist of 188 miles of line in Richland and Grant counties. Eldon Netz is president of the Richland-Grant cooperative.

* * *

Skagit Valley Telephone Co., Mount Vernon, Wash., on May 14, $542,000 second loan to this borrower.

These loan funds will finance facilities, including 169 miles of line, to serve 1,344 subscribers not provided for in the first loan. In addition, the loan will cover increased construction costs incurred since the original loan of $935,000 was approved in September, 1951.

With both loans, the borrower will be able to serve 6,857 subscribers including initial service to 2,548 rural families and establishments. Dial central offices for the system will be located at: Mount Vernon, Conway, La-Conner, Big Lake, Burlington, Edison, Belfast, Sedro-Woolley, Hamilton, Concrete and Corkindale.

Since the first loan was approved, the Concrete and the Mount Vernon central offices have been cut over to dial, and 714 additional subscribers have been connected throughout the operating area.

Under present plans, calls may be made without toll charge between several of the borrower's 11 exchange areas. Similar service is contemplated between each of the exchange areas and its nearby trading center.

The finished system will consist of 724 miles of line in Skagit County and a small portion of Whatcom County. G. J. Stover is president and manager of the Skagit Valley company.

* * *

Federated Telephone Cooperative, Benson, Minn., on May 18, $1,239,000.

The nucleus of the cooperative system will be the following telephone properties which the borrower will acquire with its own and with loan funds: Village of Odessa Telephone Co.; Danvers Rural Telephone Co.; Fairfield Farmers Cooperative; Correll Municipal Telephone Co.; Chokio Telephone Co.; and the facilities of 20 farmer-owned service station companies. These companies are now serving 1,179 rural subscribers on 624 miles of line.

With the REA loan, the borrower plans to rebuild 508 miles of the existing line, and construct 528 miles of new line. Dial central offices will be located at Odessa, Correll, Holloway, Danvers, Chokio and Swift Falls.

This rehabilitation and expansion will enable the Federated cooperative to serve 2,046 subscribers including 205 who will be switched by the Northwestern Bell Telephone Co. at Ortonville, Appleton and Morris. The completed system will consist of 1,066 miles of line. Willard Anderson is president of the Federated Telephone Cooperative.

* * *

Runestone Telephone Association, Barrett, Minn., on May 18, $128,000, second loan to this borrower.

With these funds, the borrower plans to furnish service to 133 existing and 117 new subscribers in the Donnelly community, adjacent to the present operating area. The Runestone association proposes to acquire the Taisey Telephone Co., Donnelly, rebuild the 59 miles of existing line, add 56 miles of new line, and convert the central office to dial operation.

The 250 subscribers in the Donnelly area are in addition to the 828 subscribers provided for in the first loan of $362,000 approved in September, 1952. The entire system under both REA loans will consist of 315 miles of line in Grant and Stevens counties. Dial central offices will be located at Barrett, Hoffman and Donnelly. N. F. Nelson is president and C. R. Hove is manager of the Runestone Telephone Association.

* * *

Eastern Illinois Telephone Company, Rantoul, Ill., on May 19, $1,970,000.

This company is now serving 4,128 subscribers over 593 miles of line. The borrower will use the loan, together with its own funds, to construct a system to serve 6,183 subscribers in the same general area. About 560 miles of the existing line will be rebuilt, and 10 miles of new line added. The nine central offices at Foosland, Thomasboro, Gifford, Penfield, Armstrong, Collison, Rantoul, Fisher and Potomac will be converted to dial operation, and a new dial office constructed at Flatville.

The rehabilitation and expansion will enable the Eastern Illinois company to bring improved service to the existing subscribers and initial service to 2,055 subscribers.

(Please turn to page 41)

The Solar Battery

A SOLAR BATTERY — the first successful device to convert useful amounts of the sun's energy directly and efficiently into electricity—was demonstrated on Apr. 25 at Bell Telephone Laboratories.

Scientists there, with an amazingly simple-looking apparatus made of strips of silicon, showed how the sun's rays could be used to power the transmission of voices over telephone wires. The Bell solar battery also used energy from the sun to power a transistor radio transmitter carrying both speech and music.

Bell Laboratories reported that it was able to achieve a 6 per cent efficiency in converting sunlight directly into electricity. This compares favorably with the efficiency of steam and gasoline engines, in contrast with other photoelectric devices which have never been rated higher than 1 per cent.

With improved techniques the Bell Laboratories scientists said they expected to increase this efficiency substantially. Nothing is consumed or destroyed in the energy conversion process and there are no moving parts, so the Bell solar battery should theoretically last indefinitely.

The specially prepared silicon used is obtained originally from common sand, one of the world's most abundant materials. Silicon is a semiconductor, chemically related to germanium, the material used in most transistors. Silicon has a much greater electronic stability at higher temperatures than other semiconductors.

The silicon solar battery, along with other silicon devices shown, resulted from a program at Bell Laboratories for studying silicon and its possible application in modern electronics.

A demonstration of the revolutionary new solar energy battery was planned for Apr. 26 by Bell Laboratories at the annual meeting of the National Academy of Sciences in Washington, D. C.

Although work is still in the laboratory stage, actual use of the solar battery in the telephone business is a strong possibility.

For example, silicon solar batteries might be used as power supplies for low-power mobile equipment, or as sunpower battery chargers which could be used at amplifier stations along a rural telephone system such as that now under trial at Americus, Ga. This system, using Bell-invented transistors, points to greatly increased service on rural telephone lines without the addition of new wires (TELEPHONY, Mar. 27, p. 45).

Although the sun supplies over a thousand trillion (1,000,000,000,000,000) kilowatt hours of energy daily—comparable to all the reserves of coal, oil, natural gas and uranium found on earth—man has never been able to convert more than a small fraction of this energy directly to his use.

Developed by a three -member team of Bell Laboratories scientists—G. L. Pearson, C. S. Fuller and D. M. Chapin, physicist, chemist and electrical engineer, respectively — the experimental solar battery uses strips of wafer-thin silicon about the size of common razor blades. These strips are extremely sensitive to light. They can be electrically linked together and can deliver power from the sun at the rate of 50 watts per square yard of surface.

Scientists have long sought a practical method of directly converting the limitless energy of the sun to electricity. Until now only the thermocouple and the photoelectric cell, limited by their natures to handling minute quantities of power, have been available.

The thermocouple—used to regulate industrial furnaces—relies for its action on small temperature differences in two dissimilar metals. It is also used in astronomy, to measure the light from the stars.

A common use for the photoelectric cell is in the photographers' exposure meters.

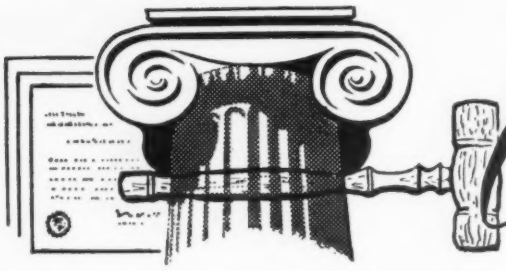
Among the other silicon devices being studied at Bell Laboratories is a lightning protector for telephone lines which would be more compact and easier to maintain than those now in use.

Also under study is a power rectifier, which can convert very large amounts of alternating current to direct current. An important feature of these is that they can operate at much higher temperatures than other crystal rectifiers now in use. All these devices when applied in the Bell System, where ruggedness, long life and reduced maintenance costs are significant factors, would offer numerous advantages over equipment now used.

Key to the new technique created at Bell Laboratories for producing these silicon devices is the controlled introduction of a foreign element into a mi-

(Please turn to page 42)

Engineer D. E. THOMAS of Bell Telephone Laboratories demonstrates the new solar battery showing that his voice can be clearly heard by M. B. PRINCE at a receiver across the lawn of the Murray Hill, N. J., facilities of the laboratories where the solar device was invented. Under ideal conditions, the transmitter can operate over a distance of several miles.



Courts and Commissions

Minnesota Companies Granted Purchase, Rate Raise O.K.'s

The Minnesota Railroad & Warehouse Commission on May 6 authorized the Sedan Rural Co-op Telephone Association to purchase the properties of the Sedan Telephone Co. The Sedan company serves approximately 23 local stations and 80 switched stations.

The commission on May 18 also authorized the Bricelyn Mutual Telephone Co. to purchase the properties of the Seely Telephone Co. The Seely company serves approximately 17 rural stations.

On the same date, the commission authorized the Monticello-Silver Creek Telephone Co., Enfield, to increase its rates for rural multi-party, company owned service from $2.75 to $3.00. It was estimated that the new rates would increase the company's operating revenues from $3,390 to $4,068 and change its net income from $341 to $689, yielding a 4.92 per cent return on an original plant cost of $14,000.

The company serves approximately 113 rural stations.

V V

South Carolina Company Granted Temporary, Deferred Rate Raise

An increase in telephone rates in each of its 15 exchanges in the state was granted to the South Carolina Continental Telephone Co., Sumter, by the South Carolina Public Service Commission on May 20.

Under the order, a "temporary" increase was scheduled to become effective on June 1 and a "deferred" increase would go into effect after the company has completed described improvements ordered by the commission.

The commission estimated that the "temporary reasonable rates" increase would produce an increase in the company's annual gross revenue of approximately $100,000. The company had requested an increase that would produce approximately $200,000.

The commission ordered that after the company had completed on or before June 1, 1956, the establishing of service to all applicants and the class of service to all applicants for service and such changes as requested by applications on file with the company on June 1, 1954, the "deferred reasonable rates" should be authorized to become effective when the improvements and expansion of service have been completed.

Telephone plant improvements also were specified before the "deferred rates" went into effect.

"Deferred rates," to become effective after compliance with improvements ordered by the commission, would be an increase over the temporary rates.

The commission directed the company to complete before June 1, 1956, the expenditure of not less than $1,055,632 for the improvement and expansion program as testified by Gordon Saunders, president of the company, during a public hearing on Nov. 19-21, 1952. This program provides for the conversion of the Lamar exchange to dial and includes expenditures beginning with Oct. 1, 1952.

The company also was directed to convert its Abbeville exchange to dial on or before June 1, 1956; to convert its Bishopville exchange to dial and construct an adequate long distance line between Bishopville and Sumter before June 1, 1956; and to convert its Lamar exchange to dial before June 1, 1956.

The "deferred reasonable rates" would become effective after this program is completed, and certified by certificate from the commission's staff.

V V

North Carolina Commission Approves New Exchange, Rates

The Norfolk & Carolina Telephone Co., Elizabeth City, was authorized on May 24 by the North Carolina Utilities Commission to establish an exchange for the communities at Kill Devil Hills and to adopt a schedule of regular monthly rates.

The commission said the new exchange will result in improved service for the Outer Banks area, including Kill Devil Hills, Kitty Hawk and Nags Head.

The company now serves the area by limited toll service stations and hopes to have the new exchange in operation by June 1.

Because demand for service fluctuates, increasing during summer months when vacationers visit Outer Banks beaches, the commission permitted the company to require a 12-month contract with new subscribers. Six-month payments will be required in advance, with monthly billings to start with the seventh month.

Business subscribers will be charged $12.50 for one-party service, $10 for two-party, $8.00 for four-party, and $6.50 for multi-party service. Residence rates will be $10 for one-party service, $8.00 for two-party, $6.00 for four-party, and $5.00 for multi-party service.

The commission said the rates may be revised if a "reasonable" test period indicates they are too high or too low.

V V

S. C. Co-op Asks for Rate Raise, Certificate Amendment

Following a hearing at which no protest was offered, the South Carolina Public Service Commission on May 21, took under consideration a petition of Horry Telephone Cooperative, Inc., Conway, for a rate increase and also a petition requesting an amendment to its certificate of public convenience and necessity previously approved by the commission.

The co-op sought a rate increase so as to qualify for a loan from the Rural Electrification Administration (REA).

It asked for an amendment to its previous certificate to take in an additional area in order to serve rural areas in Horry and Georgetown counties which are now served by South Carolina Continental Telephone Co., excluding a defined area in and around Conway.

The co-op and Southern Continental have entered into a purchase agreement for the additional area, it is understood.

V V

Grant Certificate O.K.

The North Carolina Utilities Commission on May 15 authorized the Western Carolina Telephone Co., Weaverville, to establish an exchange at Fontana Village (TELEPHONY May 22, p. 36).

Louisiana Company Asks 50% Rate Raise on Some Services

The Louisiana Public Service Commission recently received the application of the Lafourche Telephone Co., Golden Meadow, for an increase in rates, amounting to over 50 per cent on some services.

In its petition to the commission, the Lafourche company declared that, "for its telephone service presently in effect" the rates charged "do not earn a reasonable return" to the petitioner "upon its investment."

The petition was submitted by Theo F. Cangelosi, an attorney of Baton Rouge, for John A. Brady, Sr., president of the telephone company.

If all of the increases in rates are approved, the company's petition states that its monthly revenues would increase $4,225.70. On an annual basis, the increase would be $50,708.40.

Among the proposed increases are one-party business service from $4.00 to $8.50, one-party residence service from $2.50 to $5.50.

V V

North Dakota Co-op Granted Loan O.K.

The North Dakota Public Service Commission recently granted the Underwood-Missouri River Telephone Cooperative, Underwood, authority to make an $8,000 loan to be used for improvement and rehabilitation of existing facilities.

The loan will be made from the St. Paul (Minn.) Bank for Cooperatives.

The telephone company serves some 69 rural subscribers at Underwood, and owns 60 miles of rural pole line.

V V

BOOK REVIEW

"Electrical Communication Systems Engineering," TM 11-486 Technical Manual, War Department; 610 pages. Superintendent of Documents, Washington, D. C. Price $2.50.

This book is a reprint of the original issue of April, 1945, plus a 60-page supplement dated May, 1950.

Primarily prepared as an army handbook, this volume nevertheless contains much material which could be of use to managers of Independent telephone companies, particularly in its transmission, administration, and traffic chapters.

While the plant data covers mostly army field type of equipment and is hence of little value to a civil telephone system, several explanatory schematic drawings illustrate the operational principles of various units which may have an educational value. Considerable space is also devoted to telephone systems in other countries, and methods of rehabilitating telephone plant taken in captured areas.

In addition, a large portion of the book is given to telegraph, teletype, and radio operations from a military viewpoint, but which contains information which could be adaptable to civil systems. What remains of the volume concerning regular telephone plant appears to be worth the price.

The section on outside plant is rather complete and covers planning, surveying, storm loading, selection of poles, wire spacing and sagging, and contains tables of wire sizes, span lengths, and a chart on wind velocity. Included is a section on jungle lines, explaining swamp and tree-slung construction.

One of the more useful chapters is entitled "Transmission Yardsticks." Starting with an explanation of the decibel, this section covers transmission loss and gain, speech to noise ratios, noise requirements and measurements, impedance matching and repeaters. A number of tables and charts are included.

Crosstalk and its causes is also discussed. This chapter is written in simple language and makes transmission engineering considerations understandable to the practical telephone man.

A chapter on Voice Frequency and Carrier Telephony probably is of greater value in connection with line construction than with equipment. It contains useful information and tables on wire-spacing, transposition methods, and loading. It also explains how different types of facilities can be combined on long circuits, with drop-outs at intermediate points. Tables are included which show wet and dry impedance and losses on different kinds of line at both voice and carrier frequencies.

Crosstalk and transposition systems are extensively dealt with here and improvised methods are suggested for measurements when expensive transmission measuring equipment is not available.

One of the most interesting sections of the book is the more than 100 pages devoted to Technical Administration. This chapter would probably be of great use to managers of smaller telephone companies, who may be skilled in one branch of the business, but find themselves in charge of all of it. Subchapter headings of this part of the book include the following: Technical functions, Traffic management, Traffic engineering (both telephone and telegraph), Local cable plant engineering, Trunk plant engineering, Circuit assignment, installation and maintenance.

A lot of information is contained in a small space in this chapter. The sub-section on traffic management for example, covers central office work, management, switchboard operation, assignment of operators, directories, counts and observations. The engineering part covers traffic experience data, choice of switchboards, position requirements, number of trunk circuits, and other facilities. A check list is included here to assist the engineer in deciding what equipment to specify on a new board.

It perhaps should be mentioned that this volume is not an operating handbook. Though not a dull, weighty engineering text in any sense of the word, it is apparently for use of the people who control a telephone system rather than those who keep it running. The actual mechanics or practical application of many of the points covered in the text is contained in other field manuals which are frequently referred to in the text, but which probably are not available at present for civilians.

To oversimplify it, one might say that this is a handbook to tell the manager what has to be done, rather than how to do it. However, it is sufficiently complete in detail to enable such a manager to know whether he is getting the job he is paying for, and to understand what he needs in his plant.—**Reviewed by Harold B. McKay**

V V

USITA Directors O.K. Radio Subcommittee Appointments

The board of directors of the United States Independent Telephone Association at its May 10 meeting authorized the appointment of a subcommittee of its Radio Service Committee to deal with problems relating to frequency coordination of carrier systems.

The members of the subcommittee are: C. H. McLean, chairman of Chicago; D. S. Seitz of York, Pa., and C. W. Frank of Chicago.

It will be the duty of the subcommittee to make recommendations calculated to be of assistance in bringing about compatability of various carrier systems employed in telephony.

V V

Warner Named USITA Director

The United States Independent Telephone Association recently announced the appointment of Leslie H. Warner, president of Leich Sales Corp., to the board of directors of the USITA, to fill the vacancy caused by the resignation of Roy W. Siemund, who recently retired.

YOU BUY DEPENDABILITY

WHEN YOU BUY A RAYTHEON RECTICHARGER

(BATTERY CHARGER)

Dependability is the number one requirement of equipment for the Telephone Industry.

RAYTHEON ENGINEERING REPORT

SUBJECT: Oldest RectiChargeR
Careful testing and inspection of this unit reveals:

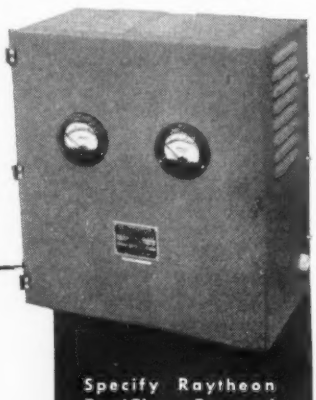
1. Electrical qualities in no way impaired (see chart).
2. A noticeable lack of rust or corrosion on chassis, hardware and components.
3. Original paint shows no sign of deterioration.
4. No evidence of embrittlement or cracking in varnish on magnetic components.
5. All hardware sound and secure.
6. Cable firm and unbroken.
7. Lacing intact with all wiring firmly in original position.
8. All soldered joints secure and strong.

(Signed) George L. Blais
ENGINEERING DEPT.

The dependability of Raytheon RectiChargeRs is amply demonstrated by the service records of units now in use. A typical example is shown in the Engineering Report at the right. And there's no reason why the "old" RectiChargeR described in the report can't go on giving the same faithful service for many more years.

It's no accident that Raytheon RectiChargeRs are setting performance records. Every detail of electrical and mechanical design has been carefully worked out with dependability as the guiding principle.

You get dependability automatically when you buy a Raytheon RectiChargeR, just as you get fully automatic battery charging — with constant voltage output over the complete load range regardless of input change — without under or overcharging.



RAYTHEON
MANUFACTURING COMPANY
EQUIPMENT SALES DIVISION
DEPT. 6270-T, WALTHAM 54, MASSACHUSETTS

DISTRICT OFFICES: BOSTON, NEW YORK, CLEVELAND, CHICAGO, NEW ORLEANS, LOS ANGELES (WILMINGTON), SAN FRANCISCO, SEATTLE
INTERNATIONAL DIVISION: 19 RECTOR ST., NEW YORK CITY

RAYTHEON PRODUCTS INCLUDE: RectiChargeR* battery chargers; RectiFilteR* battery eliminators; Voltage stabilizers (regulators); Transformers; Tubes and other electronic equipment.

*Reg. U. S. Pat. Off.

Specify Raytheon RectiChargeRs and RectiFilteRs for completely dependable Telephone service. Your supplier offers a complete line for all requirements. Ask him for details or write direct.

CASE TRANSPOSITION BRACKETS

Continued from page 18

to the engineering department with a request to determine the most economical, as well as the most practical, method of meeting the traffic request. This line had, several years ago, reached its maximum as an open wire line in that no more open wire could economically be added. Over a period of time retransposing work had been performed and carrier channels had been added to the extent that each pair of physical wires was carrying from one to three carrier circuits.

The top cross-arm had been transposed to 30 kc design, which is suitable for three-channel carrier operation on each pair of wires, except the pole pair. The remaining positions were suitable for single channel carriers only.

The engineering department, after comparing the costs of toll cable, microwave, and retransposing and adding multi-channel carriers, decided on the latter as being the most economical and most practical method to recommend. This method required going to the 0-1 (156 kc) design in transpositions, which required reboring and respacing the wires to an 8-inch spacing between each wire of the pair, except the pole pair which is not considered suitable for multi-channel carrier operation. This scheme also necessitates the elimination of phantom circuits on all horizontal groups.

An engineering estimate in the amount of $42,000 was originally presented to accomplish the retransposing of this line. However, this estimate was revised as it was found that by using portable electric generators and drills for reboring the cross-arms, and by using the Case type transposition brackets instead of a more costly type, the estimate was reduced to $24,000.

This job required the reboring of 1,932 cross-arms, the placing of 2386 Case type transposition brackets at poles, 350 float or midspan brackets, the removal of 826 single type brackets and 176 phantom brackets. Of course, at each location we had to perform the necessary wire work to cut in or cut out each transposition.

As previously mentioned, the Case type transposition bracket, because of its low cost and simplified installation, was very instrumental in considerably reducing the cost of our job. Before purchasing this bracket in considerable quantities, we made a thorough investigation of its merits. I might also mention that three years ago we purchased 900 of the Case brackets and used

them on a retransposing job. This was done on a sort of field trial basis and watched very closely for the development of possible trouble. However, we find that these brackets have stood the test successfully.

The Case roller type transposition bracket was invented and developed by the late Rogers Case, a communications engineer with more than 40 years of experience. The brackets are made of aluminum in two styles, namely, cross-arm point type and span point type.

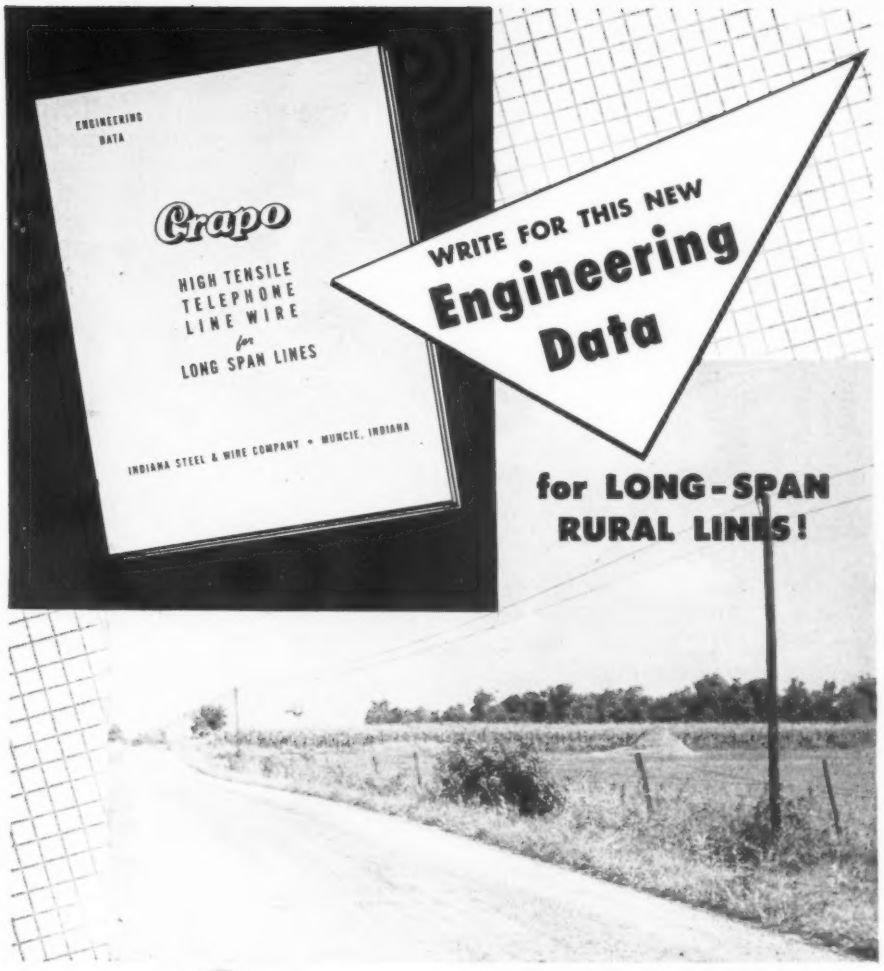
We found that the roller method was available only in the Case bracket and it gets its name because the glass insulator on the bracket *rolls*, that is, it revolves on a pin. This is a new idea. We find the bracket saves labor in that it makes it possible for long runs of wire to be tensioned in one operation because the insulators roll, permitting free movement of the wire at the transposition point. Labor costs are substantially lowered, therefore, and, in addition, a more uniform and proper sag is obtained.

The Case span transposition bracket allows a transposition at the exact point designated, regardless of pole location. This feature is of tremendous value in installing multi-channel carrier circuits where near-perfect line balance is necessary and, therefore, a small amount of variation is allowed in transposition points. This bracket is simple in design, lightweight and easily installed. It eliminates the cost of constructing and maintaining special transposition poles.

We find that the maintenance problem, because of glass insulator breakage, is greatly simplified since no emergency insulator replacement is necessary. In the event of insulator breakage, the line wire falls on a special rubber bushing, assuring the continuity of circuit operation with no loss of communication service. Circuit efficiency is maintained in spite of glass breakage. Thus, the costly emergency insulator replacement problem becomes a routine maintenance job.

V V

"Over in Russia the Communists have long been using capitalistic methods to get their production up. The man who produces the most gets the most pay. They have had piece work for years. They have had a wide pay differential. . . . And now as a means of making an excuse for this use of capitalistic measures they claim to have invented something new. It's just old-fashioned American incentive pay, based on the theory that he who produces the most should receive the greatest remuneration. . . ."—Windom (Minn.) *Citizen*.


ENGINEERING DATA
Crapo
HIGH TENSILE TELEPHONE LINE WIRE for LONG SPAN LINES
INDIANA STEEL & WIRE COMPANY • MUNCIE, INDIANA
WRITE FOR THIS NEW
Engineering Data
for LONG-SPAN RURAL LINES!

SPECIFY Crapo HIGH-TENSILE

TELEPHONE LINE WIRE FOR LOWER OVERALL COST

Crapo HTL-85 INDIANA STEEL & WIRE CO. MUNCIE, INDIANA U.S.A.

For Medium Long Spans

Crapo HTL-135 INDIANA STEEL & WIRE CO. MUNCIE, INDIANA U.S.A.

For Longer Spans

Crapo HTL-190 INDIANA STEEL & WIRE CO. MUNCIE, INDIANA U.S.A.

For Extra Long Spans

● FEWER pole structures are required where Crapo High-Tensile Line Wire is used in building rural telephone lines. This means substantial savings in time, labor and material. There are fewer holes to dig and poles to set, less material to be handled, installed and connected — all of which contribute to lower overall construction costs.

Crapo High-Tensile Line Wire also makes for lower maintenance costs. Its superior tensile strength offers increased resistance to ice and wind loads . . . provides a greater margin of safety. Heavy galvanized coatings assure dependable, lasting protection.

For maximum savings in the construction and maintenance of rural telephone lines, specify the Crapo Telephone Wire which best fits your requirements.

LATEST ENGINEERING DATA, including Stringing Sags and Tensions, Staking Tables and Guying Tables for Heavy, Medium and Light Loading Districts, are now available. Write today for your copy of Data Book No. N-53.

INDIANA STEEL AND WIRE CO., MUNCIE, IND.

IN THE NATION'S CAPITAL

Concluded from page 20

about this valuable exercise of industrial democracy is the *voluntary* character of the investor's choice. When an American citizen puts down his hard-earned money for a share of stock in a railroad company or telephone company, he is investing in his own country. He has bought himself a piece of America. He has given the enterprise system his vote of confidence. He can renew or withhold this vote of confidence every year, when the management sends him a proxy statement. Nobody makes the citizen investor put down his money. He has plenty of other free choices, from thousands of corporations, listed on the stock exchange or traded over the counter of investment dealers.

Consider how different is this from so-called publicly owned utilities, whose advocates like to boast that they are owned by the people and operated for the people. If the citizen of New York, or Illinois, truly realized, when he pays his income taxes on Mar. 15, that he has become an *involuntary* underwriter of government-owned power plants to provide cheap or subsidized electricity to people in Tennessee or elsewhere, he might not be so enthusiastic about so-called "public" ownership. Certainly there is nothing much voluntary about it. Nobody asks him whether he *wants* to make this investment, if, indeed, a pocketbook-cancer type of venture (which comes back every year for more and more congressional appropriations) can be dignified by the name of investment. No, the citizen whose taxes are tapped to finance local benefits for other areas of the country, has only one other choice. He can go to jail if he refuses to pay the taxes. Of course, he could take Edmund Burke's famous remark about taxes and die—leaving the problem for his estate, if any.

True, if enough citizens get sufficiently angry to vote *government* management out of political office, there might be some change or slow down in the over-all policy towards more public ownership. But usually a general election verdict is based on so many issues and on such a variety of questions—international and domestic—that what the citizen might want to say on this particular phase of congressional action is lost in a great big political package deal. What's more, there are so many million other voters, who have little or nothing to lose in taxes, and who might very well gain from the pork barrel, that the few citizens who have put by a few dollars, which might otherwise be invested, are outnumbered.

At least, we do have this over-all vote on policy, as long as we remain a democracy. More than half of the world, beyond the Iron Curtain, does not have that much choice. In such countries the government does not pretend to be in business for the public. The public is in business for the government.

Even that perennial gadfly of stockholders' meetings, Mrs. Wilma Soss, who has made a career of heckling corporate management without discrimination, gives us a valuable lesson. Mrs. Soss is a lady who generally shows up at AT&T or other big corporation stockholders' meetings to demand that a woman be placed *on the* board of directors. Her argument is that women often constitute a majority of the stockholders of such corporations and that they should be represented. The fact that seems to escape Mrs. Soss is that these same lady stockholders repeatedly vote in favor of men directors, which tends to disprove her own point. But anyhow the lady has become a sort of comic relief at stockholders' meetings, even if she did have to be removed by more than persuasion at the New York Central meeting. The point is that Wilma has the same right as any owner of a single share (that is about the size of her representation in some of these meetings) to get the floor and demand a decision by the meeting. She got it at Albany.

V V

General Company to Inaugurate Customer Toll Dialing

Operation of automatic dial service and customer long-distance dialing will commence at Wenatchee simultaneously on June 26, barring unforeseen circumstances, it has been announced by division manager Roy E. Downey of General Telephone Company of the Northwest.

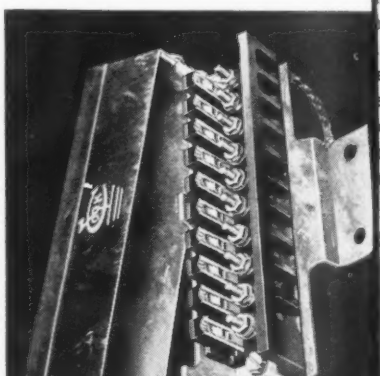
Marking a major step in General's $1,500,000 improvement program for the Wenatchee area, underway since January 1952, the inauguration of customer long-distance dialing facilities will link Wenatchee, Cashmere, Entiat, Leavenworth, Peshastin, Quincy and Waterville.

V V

". . . Any government with strongly centralized power poses a threat to personal liberty. Each time we take another step toward socialism, government control and higher taxes in our own country, we should pause and think what life offers for the individual in countries where power is vested in the state."—ODESSA (TEX.) *American*.

Construction and
WITH THE DOUB
STROMBERG-CARLS
LEADI

cook type 7
high-potential lightning arrester



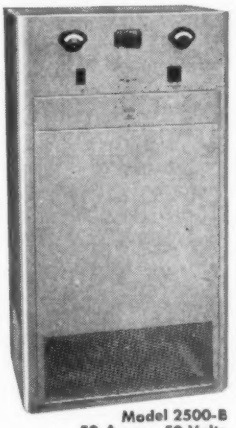
Outdoor pole type arrester pr
vides lightning protection a
atmospheric static drain for fi
pairs of open-wire circuits, or
drop wires and cables leading
unprotected terminals.

Equipped with:

1. Single piece molded Bakelite in
lation and fanning strip for stren
and high resistance. Fanning s
is closed with a thin film of Be
lite until drops are run.
2. Non-corrosive metal hood, Ev
dur studs and galvanized mount
bracket for long service life.
3. Phosphor-bronze spring clips
accommodate Cook Tru-Gap n
grounding lightning discharge

...aterials
...Supplies
...ARANTEE OF
...ID AMERICA'S
...ANUFACTURERS

for 3-phase operation . . . be safer
and surer with **flotrol automatic battery charger**



Model 2500-B
50 Amps., 50 Volts

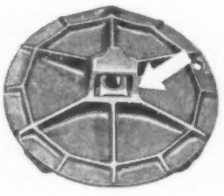
Except for the starting and battery disconnect contactors, the FLOTROL does not contain any moving parts—an assurance of higher efficiency, complete dependability and longer service life. All components are in one cabinet and no special foundations are needed, reducing installation to a minimum. DC voltage delivered is regulated within ± 1%. Complete overload protection is as automatic as charging itself.

WRITE for Bulletin 161—completely describing the FLOTROL system for 3-phase operation.

...everstick anchors

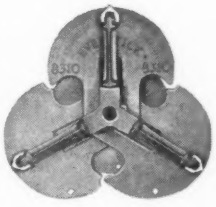
...are designed to meet the most rigid ...oring and guying specifications.

...patented EVER-...K Nut Housing locks ...r firmly on rod, ...ng installation ...e under all condi-...nd permitting easy ...ry of the rod. Note ...designed, heavily ...ructed sections of ... in base plate.



...STICK Expanding ... are *ribbed* to ...le their original ...th; their cutting ...and wedge shape ...ocket reduces earth ...nce to a minimum ...ssures easy expan-

...-Way EVERSTICK ...xpanding plates— ...cts solid earth at ... point around base ... giving full benefit ...th's holding power.



...der Arms extra ... ribbed with ball ...ocket joint at top ...clinched socket on ...ding plates allow ... bearings to move ... with minimum fric-... insuring easy ex-...on which eliminates ...ing or breaking of

...EVERSTICK Anchor
...the anchor of merit

better than ever!

DIAMOND C POLES

For durability, use DIAMOND C

COLFAX LUMBER & CREOSOTING CO., INC.

because they're made in a new and modern plant

Something new has been added!—at Pineville, Louisiana—a modern, enlarged creosoting plant offering faster delivery and better-than-ever quality in telephone poles of this well-known, well-liked brand.

Diamond C poles are made of Southern pine, carefully selected from live growing trees and graded according to physical properties desired. Each pole is pressure-treated with 8 lbs. (or more if you wish!) of grade No. 1 Creosote Oil, in accordance with AWPA specifications.

Reduce loss in revenue due to pole failure. Buy Diamond C from S-C!

Distributed by

STROMBERG-CARLSON

ROCHESTER • CHICAGO • ATLANTA • KANSAS CITY • SAN FRANCISCO • TORONTO

High Fidelity Radios and Radio-Phonographs

Office Intercom Equipment

Electronic Carillons for Churches and Public Buildings

Sound and Public Address Systems

"Panoramic Vision" Television Receivers

AND MANY OTHER ELECTRONIC PRODUCTS FOR OUR ARMED FORCES

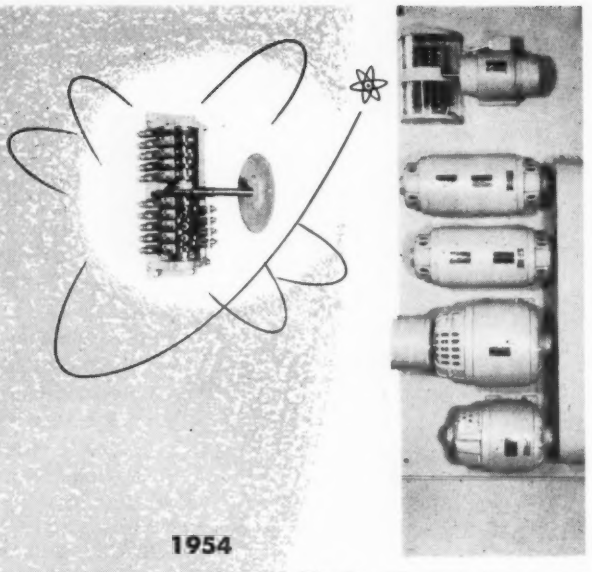
1947-1954

Eight years of better telephony with

ESCO

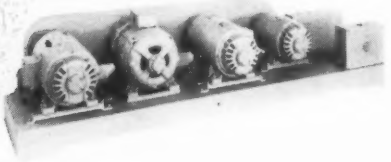
Ringing Machines
Tone Alternators
Generator Sets
Interrupters

Harmonic
Synchromonic
Decimonic



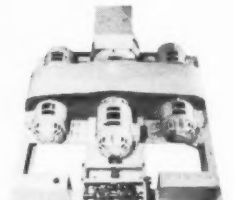
1954

Mar Vista, California. All connections at terminal board. Lubricated-for-life ball bearings throughout. Rugged, dependable construction. Equipped with coin controls — PLUS — A new and improved interrupter design. The pile-up is equipped with positive micro setting control of finger positioning. Another exclusive with ESCO



1951

Clarinda, Iowa. Simplified hook-up



1949

Oxnard, California.
Improved interrupter design

1947

Rochester, New York. A new, better motor generator set

MOTORS ★
GENERATORS ★
CONVERTORS ★
DYNAMOTORS ★
GENERATOR SETS ★

ELECTRIC SPECIALTY CO.
176 SOUTH STREET, STAMFORD, CONN.

Specify ESCO when ordering ringing equipment.

ILLINOIS INDEPENDENTS

Concluded from page 25

of Park Ridge and R. C. Ross of Clinton. Daniel Schaefer of Sycamore was elected a director to replace H. A. Joslyn of Sycamore, resigned.

The directors re-elected the following officers: President, Mr. Alter; vice president, Mr. Aller; secretary, Mr. Hardy; treasurer, R. B. Still of Bloomington, and general counsel, Mr. Boynton.

WISCONSIN CONVENTION

Continued from page 27

chairman of the association's foreign exchange and extended area service committee, reported on the committee's progress. He said it was their belief that flexibility within a company's territory is essential to adequate service to the public; also that the key to territorial integrity is a boundary map on file with the Wisconsin commission.

Mr. Odegard stated that for many companies the paperwork prior to filing the boundary maps had been the major barrier to filing. Therefore, the committee had established a simplified procedure for this important step.

Mr. Odegard listed the benefits of extended area service (EAS) as:

(1) It tends to stabilize revenues.

(2) It tends to result in a net increase in revenues.

(3) It tends to secure boundaries. (Incidentally, on this point, Mr. Odegard observed that the commission recognizes that EAS tends to speed up telephone service between cities.)

(4) It makes available a considerable subscriber growth potential.

Mr. Odegard went on to describe the actual agreements that must be reached between two companies contemplating EAS. He reminded his listeners that the USITA believes that a "use" basis rather than a "per customer" basis is the proper way to arrive at revenue separations.

"Let's Promote Business" was the joint topic discussed by P. M. Ferguson Jr., Mankato, Minn., member of the USITA Advertising Committee, and Ray J. Hanauer, supervisor of toll promotion, Wisconsin Telephone Co.

Mr. Ferguson emphasized the fact that the customer today is becoming more and more discerning. Therefore, he said, there is a tremendous need to sell service; sell rates; sell investments in the telephone business, and sell regulatory bodies on the need of adequate rates.

He went on to outline the various

ways to sell the public. He said personal contact is good, but when a company has over 100 stations this is difficult.

The best way to reach the public is through the open house method, Mr. Ferguson said. At this type of gathering, he advised letting subscribers know the cost of plant through appropriate exhibits—for example, pieces labeled with prices; also letting visitors know more about the company and its operations by handing out booklets designed to inform the public.

Mr. Ferguson also recommended presenting a company's story to the public through regular, planned advertising in the local newspaper. He said this leads to contact with the editor, who can be a valuable source of information about new highway or real estate developments, for instance.

Also endorsed by Mr. Ferguson was the distribution of toll credit cards.

Mr. Hanauer stressed selling activities designed to increase toll business. He said that within the Bell System salesmanship has demanded that the name "out-of-town calling" replace "toll call" or "long distance." He outlined the following ways to build a company's toll business:

(1) Hold meetings to encourage employes to talk up toll calling, and have printed information on it for distribution.

(2) Advertise the use of toll calls for anniversaries, birthdays, calling ahead for appointments, keeping in touch with son or daughter at college, and for ordering long distance.

Next day the report of the resolutions committee, chairmanned by G. A. Karcher of Wheatland, opened the session.

H. B. Flower of Wisconsin Rapids and H. F. Jahnke of McFarland handled the topic of "Micro Filming for Toll Billing" jointly.

Mr. Flower, in analyzing the job of subscriber billing, quoted Walter Chrysler, who once said, "There is no such a thing as a big job. Any job, regardless of size, can be broken down into small jobs, which, when done, complete the large job."

Mr. Flower went on, "For years we have watched our employes work long hours on the laborious task of transferring information from little toll tickets to toll statements. . . . To us, that constituted a big job.

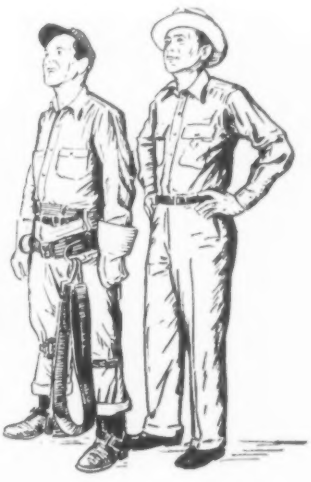
"The next objection to our old method came when we had to provide storage boxes and storage space for all those thousands of tickets. . . . Finally came the last step—the destruction of those same tickets that had received such

Linemen call this hoist a "HONEY"

Designed especially for line work, this NEW CHANCE HOIST has all the features linemen want!

Here's what makes this ONE-TON HOIST the linemen's favorite:

- Well-balanced, easy-to-grip handle that operates from either side to avoid obstructions.
- "Free-wheeling" for ease in hooking to load, with an automatic locking control to prevent accidental dropping of load.
- Both half link and full link take-up for accuracy and speed.
- Easy working swivel hooks on both the chain and the hoist housing. Safety latch hooks, if desired, at slight additional cost.
- All working joints fitted with permanently lubricated oilite bearings.
- All working parts fully enclosed in the housing to prevent injury to fingers.



Here's the tool your linemen asked for in a nationwide field survey—a tool developed by Chance engineers, who *know* line work. It has all the good features linemen said they wanted in a hoist. It's a strong, fast-operating, lightweight tool (12 pounds) with a flexible steel load chain that won't kink, bind or uncouple. Controls can be worked without removing gloves. It's rated to lift a one-ton load and it's tested to 3000 pounds. Give your lineman the extra help and safety that the Chance Hoist can provide.

CT54-9

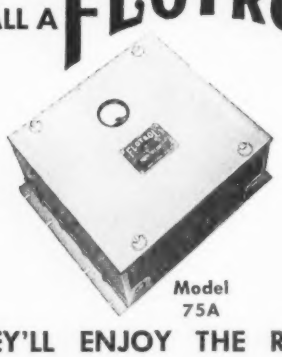
A·B·CHANCE CO·

CENTRALIA, MISSOURI • SAN FRANCISCO, CALIFORNIA

ABC INDUSTRIES

TAKE A LOAD OFF
YOUR BATTERIES

AND OFF YOUR MIND
INSTALL A FLOTROL



Model
75A

THEY'LL ENJOY THE REST

AND SO WILL YOU

FLOTROL has no moving parts, requires no routine maintenance or adjustment; it supplies the load current as you need it, doesn't wait for the load to pull the battery down and then recharge the battery. Result—longer battery life, less power consumption, fully charged batteries all the time, and scores of maintenance man-hours saved yearly.

Single-phase models from 1/2 ampere to 24 amperes, described in Bulletin 160.

Three-phase models from 25 amperes to 200 amperes, described in Bulletin 161.

LORAIN PRODUCTS CORPORATION
8122 F STREET LORAIN, OHIO

FLOTROL
PARTNERS IN DEPENDABILITY
SUB-CYCLE

loving care all along the line, and that now consumed a lot of valuable time to destroy. That, too, was a big job."

Mr. Flower related how his company elected to try microfilming of toll tickets. Today, he said, eighteen monthly billing periods have passed and the company is ready to speak concerning the true value of this operation.

Mr. Flower listed the steps in the microfilming procedure, and gave his company's costs.

Then Mr. Flower summed up, saying:

"Now—for the payoff—what has Operation Microfilm accomplished for us?

"(1) It is not difficult to prove that microfilming of tickets saves us the wages of one girl. That does not mean that we have eliminated an employe, but rather that we have done away with costly overtime during the billing period. Further . . . we now have employe time to devote to other necessary clerical duties without hiring additional help.

"(2) It has provided the finest means of top level promotion for better public relations. . . .

". . . we have never introduced an operating practice that has met with such universal approval. . . ."

Mr. Flower observed that now his company seldom experiences a complaint or question. The company has established a collection point on each side of town, namely two drug stores, and has found that payment of each bill is a little less painful for the subscribers.

He explained:

"Rarely do we find a ticket billed to the wrong subscriber. However, when that happens, the subscriber brings the misfiled ticket to our office. We adjust the matter by accepting the ticket and giving immediate credit to the customer. The ticket is then re-checked, and goes back for re-filing with the next month's business.

"If a subscriber disputes a ticket, he must come to our commercial office and bring the ticket in question with him. There again, we do not have to hunt out the original toll ticket, but are ready to take quick action concerning his complaint. . . .

"We have pointed out the fact that toll ticket storage, and later, destruction, was a big problem. Under Operation Microfilm we have only the problem of filing two small 5" x 5" x 1 inch containers for each month's toll tickets. In a period of 18 months, we have not accumulated enough processed film to occupy the space formerly required for one month's toll tickets.

"We have not, as yet, disposed of any film simply because it has not taken up enough space to make disposal necessary. This film can be destroyed in a matter of minutes by removing the film from the container, and throwing it in an open fire. . . ."

Mr. Flower said, "We believe that many of you can employ microfilm to advantage, but we also realize that there are a number of smaller companies who cannot, at this time, prove in the purchase of equipment, or even the use of such equipment. We would urge that you not close your eyes to the possibilities of microfilming toll tickets, possibly on a cooperative or group basis. Operation Microfilm is a proven success in our company."

Mr. Jahnke then discussed microfilming from the standpoint of the smaller company—one which had used microfilm equipment first on a rental basis. He reported that the microfilming is done now by a Madison company at a cost of $4.00 per thousand.

DeLoss Walker, a lecturer and writer from Chicago, gave an inspiring and powerful talk titled, "Is It Recession or Reality?" His opinion was that we are now going through a corrective period, but that when the bumps have been absorbed the nation will emerge stronger than ever before. He said, "We are now going forward—throwing off our shackles—to a new freedom."

Mr. Walker warned that the corrective period is precipitating severe competition. He said, "It will separate the men from the boys, and the boys, if they live, will work for the men." He added that the customers are "boss" and can "break" a company if they decide they don't like what they're buying. Thus it behooves telephone people to continue giving the best possible service. The telephone company competes for every revenue dollar with the sellers of luxuries and even some items termed necessities, Mr. Walker said.

To get in the competitive mood, he added, requires that one adopt the philosophy that, "Nothing we're doing today is going to be good enough tomorrow."

Three new members were elected to the association's board of directors. They are: H. B. Flower of Wisconsin Rapids; R. M. Keating of Wausaukee, and H. P. Siebken of Madison.

Of the directors whose terms expired in 1954, J. F. Benjamin of Cumberland; A. H. Bowden of Almond, and T. H. Sanderson of Rio, were re-elected.

The directors elected the following officers: President, B. H. Piepmeier; vice president, J. F. Benjamin; treasurer, W. E. Lawton, and secretary, Ray J. Riordan.

V V

"Few things are impossible to diligence and skill."—JOHNSON.

REA LOAN ALLOCATIONS

Concluded from page 30

The completed system will consist of 598 miles of line. W. C. Drysdale is president and manager of the Eastern Illinois Telephone Co.

* * *

Vernon Telephone Cooperative, Westby, Wis., on May 20, $525,000.

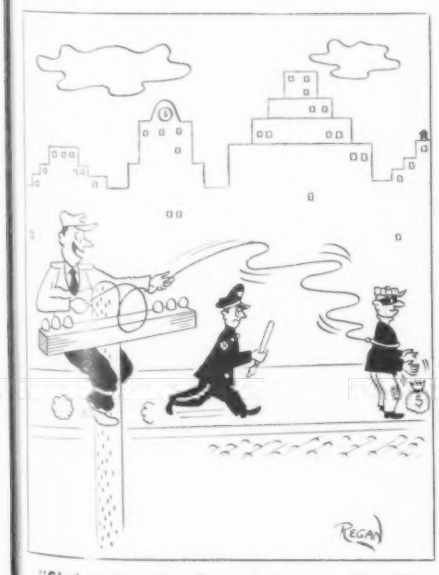
The following companies which the borrower will acquire will serve as the nucleus for the new cooperative: Liberty Pole Telephone Co. and the Pleasant Ridge Telephone Co., both at Viroqua, Wis.; Ferryville Telephone Co. and the Nash Ridge Telephone Co., both at Ferryville; and the Bad Axe Telephone Co. at Genoa. These facilities now provide service for 313 subscribers over 198 miles of line.

The REA loan will enable the new cooperative to serve 866 subscribers including service to 553 rural families for the first time. About 188 miles of the existing line will be rebuilt, and 171 miles of new line added. New dial central offices will be constructed at Liberty Pole, Red Mound and Romance.

Under plans of the cooperative, calls may be made among all three exchange areas without toll charge. The completed system will consist of 359 miles of line. Ole Traastad is president of the Vernon Telephone Cooperative.

V V

"Nine times out of ten, the best thing that can happen to a young man is to be tossed overboard and compelled to sink or swim for himself. In all my acquaintance I never knew a man to be drowned who was worth the saving."—JAMES A. GARFIELD.



"Glad to be of assistance to you, officer!"

it's dated

YOU CAN PROVE IT TO YOURSELF!

ALPHADUCT DUMBBELL TYPE
NEOPRENE JACKETED DROP WIRE

LASTS LONGER • COSTS LESS!

Every coil of ALPHADUCT drop wire is dated by means of a color coded thread which indicates the year it was manufactured. In this way, with no record keeping, no muss, fuss or bother, you can tell how long Alphaduct stays up without requiring service or replacement.

We know that our dumbbell type neoprene jacketed drop wire will last. It's tested thoroughly through every manufacturing stage. The tough neoprene jacket resists abrasion, moisture, sunlight, oil, water. The insulation sticks tightly to the conductor. The dumbbell or figure eight shape makes the wire easy to split, makes a neat installation.

You, too, may know all this for sure by trying Alphaduct drop wire. And . . . by dating the wire we make it easy for you to prove to yourself that this is the most sensible drop wire investment you've ever made.

IT'S DATED • FOR YOUR CONVENIENCE AND PROTECTION

ALPHADUCT WIRE AND CABLE COMPANY
MILLTOWN, NEW JERSEY

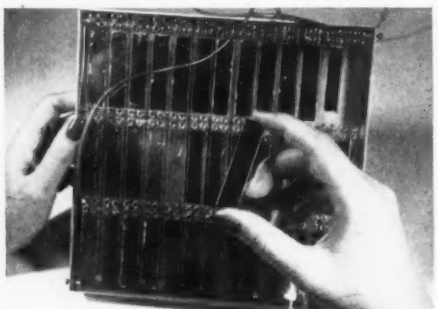
NATIONAL DISTRIBUTORS—LEICH SALES CORPORATION—CHICAGO, ILL.
REGIONAL DISTRIBUTORS—THE LINDSAY TELEPHONE SUPPLY CO., CLEVELAND, OHIO
PANKEY SUPPLY COMPANY, CHARLOTTESVILLE, VA.

THE SOLAR BATTERY

Concluded from page 31

croscopic layer near the surface of a thin slice of silicon. This process has been developed in the laboratories by C. S. Fuller.

Treatment under gas at high temperatures permits the introduction of



A solar battery, converter of the sun's energy directly into electricity. Specially prepared silicon strips the size of common razor blades are linked in series in the device shown, while the hand holds an individual strip.

minute traces of impurities into the atomic structure at the surface of the silicon. Introduced at a precise rate and under carefully controlled conditions, the impurities reach a depth of less than one ten-thousandth of an inch. This is essentially a "p-n junction," which is the heart of all these devices and which, when built into a germanium single crystal, is the basis for the junction transistor, also invented at Bell Laboratories.

V V

FCC Will Observe Twentieth Anniversary on June 19

The Federal Communications Commission (FCC) will be 20 years old on June 19, 1954.

For it was on June 19, 1934, that its creative act—the Communications Act of 1934—was signed.

As stated in that statute, the commission was established—

"For the purpose of regulating interstate and foreign commerce in communication by wire and radio so as to make available, so far as possible, to all the people of the United States a rapid, efficient, nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges, for the purpose of the national defense, for the purpose of promoting safety of life and property through the use of wire and radio communication, and for the purpose of securing a more effective execution of this policy by centralizing authority heretofore granted by law to several agencies and by granting additional authority with respect to interstate and foreign commerce in wire and radio communication . . . "

Though a previous law — the Radio Act of 1927 — created and gave the predecessor Federal Radio Commission certain regulatory powers over radio, including some radio supervision that had been exercised by the Department of Commerce, it did not give the commission jurisdiction over telegraph and telephone carriers. Consequently, divided and sometimes overlapping authority was exercised by various Federal agencies in the common carrier field.

Accordingly, in 1933 a government interdepartmental committee recommended that radio, wire and submarine cable communication services "should be regulated by a single body." The result was the adoption of the Communication Act of 1934, which established the Federal Communications Commission for that purpose.

That act coordinated in a single agency broadcast regulatory functions, previously exercised by the Federal Radio Commission; certain supervision of telephone and telegraph operations formerly vested in the Interstate Commerce Commission; jurisdiction over government telegraph rates which had been under the Post Office Department, and some powers of the Department of State with respect to submarine cable landing licenses. It gave the FCC certain additional authority, including supervision of rates of interstate and international common carriers, and domestic administration of international treaties and other agreements concerning electrical communication to which the United States is a party.

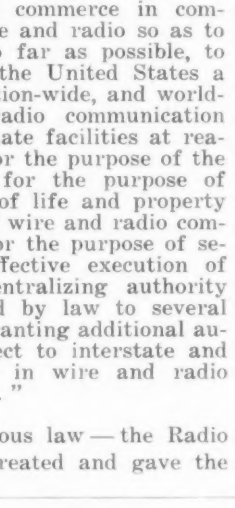
This unification of federal wire and radio communication regulation was accompanied by the transfer to the new commission of related personnel, records and property of the Federal Radio Commission and units of other agencies involved.

In this connection it is interesting to note that four present members of the FCC were associated with the original commission. Chairman Rosel H. Hyde transferred to the commission from the Federal Radio Commission as an attorney. Commissioner Edward M. Webster who, as a lieutenant commander in the Coast Guard was a member of the interdepartmental committee which recommended unification of electrical communication regulation, joined the FCC in 1934 as a member of its engineering staff. Commissioner George E. Sterling came to the FCC from the Federal Radio Commission as an engineer. Commissioner Robert T. Bartley was director of the commission's original Telegraph Division.

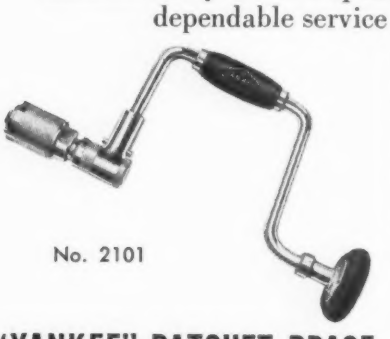
The commission started to function on July 11, 1934, when the initial commissioners took their oath of office.

On that date the commission had 235 employes, of which number 121 were in

Speaking of "Telephone Numbers"...



Here are two "Yankee" Tool "numbers" that have become first choice of telephone linemen everywhere. Dependable tools for dependable service men.



No. 2101

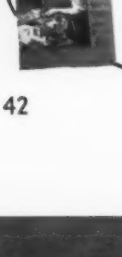
"YANKEE" RATCHET BRACE

It's a time-saver with a smooth, easy ratchet action. Shifter will not move during drilling. Quick-centering ball-bearing chuck holds bits firmly. Ingenious assembly of sweep hand eliminates excessive play and binding. Practically unbreakable hard rubber handles.

No. 41

"YANKEE" PUSH DRILL

Another long-standing favorite with telephone men. "Yankee" chuck construction holds drill points so they cannot be pulled out when tool is in use. All exposed parts are chromium plated. Magazine handle holds 8 drill points, 1/16" to 11/64".



Write for free "Yankee" Tool Book. "Yankee" Tools, 209 W. Lehigh Ave. Phila., 33, Pa.

STANLEY®

"YANKEE"® TOOLS

A Division of The Stanley Works

Washington. At the close of its first year the FCC personnel had increased to 442. During its initial year the commission operated on an appropriation of $1,188,176, according to the FCC.

However, at that time the number of authorized radio stations of all kinds was only about 51,000, and the number of commercial and amateur radio operators collectively was fewer than 67,000, the commission stated.

Today the number of radio authorizations exceed 1,100,000, including more than 260,000 station authorizations, which cover the use of some 600,000 fixed and mobile transmitters, and more than 860,000 different grades of licenses and permits are held by commercial and amateur radio operators.

The ensuing 20 years have seen the advent of TV and FM as regular broadcast services; entrance of TV into the UHF frequencies and the debut of visual broadcast in color; non-commercial educational FM and TV operation; extension of the usable radio spectrum and the birth of many new non-broadcast radio services; utilization of radar and other electronic developments; expansion of common carrier facilities to the inclusion of overseas telephony and the use of domestic coaxial cable and microwave adjuncts, and an increasing number of individuals who operate radio transmitters for a livelihood or as a hobby. For radio alone there are now more than 60 categories of users who employ its conveniences for a myriad of purposes, which, in range, extend from the cradle to the grave, it is said.

To handle this increased business, the commission now has about 1,100 employes, one-third of whom are engaged in field engineering work. Its fiscal 1954 appropriation is 7.4 million dollars, the commission reports.

Less than 10,000 applications of all kinds were received by the commission during its first year of operation. In 1953, the number was about 352,000, not including legal and traffic filings.

Many radio operations of two decades ago were on an experimental basis. These included "visual," "high fidelity" and "very high frequency" broadcast, also various embryo non-broadcast services. Most of today's equipment and techniques developed from such testing, plus developments spurred by World War II requirements. Requests for directional antennas were just beginning to be received in 1934.

At that time there were two rival domestic wire telegraph companies and various international telegraph carriers operating in the United States. Collectively, they handled nearly 170 million telegraph messages in 1934, of which number about 14 million were international messages. The new single domestic telegraph carrier (Western Union) handled about 170 million landline messages in 1953, while the volume of international telegraph traffic amounted to 24 million messages for that year.

Twenty years ago the United States had slightly more than 17 million telephones, over which an average of 74 million calls were made daily. This nation now has in excess of 50 million telephones, over 80 per cent being in the Bell System which averages about 185 million calls a day.

The commission's increased regulatory workload is further reflected in its field engineering activities. For example: In 1934, about 20,200 radio operator applicants were examined in the field and some 12,000 licenses were issued. Last year the field staff conducted more than 115,000 such examinations and issued 176,000 commercial operator authorizations, according to the FCC.

Complaints of interference to radio reception in 1934 numbered less than 3,800. Due to the mounting number of radio stations, the extreme sensitiveness of TV reception, and the in-

"Tops" IN THE MONEY-SAVING BRACKET

CODE No.
SE-1648 R.H.
SE-1780 L.H.

CASTINGS MADE FROM ALUMINUM ALLOY

CASE ALUMINUM TRANSPOSITION POINT BRACKETS

Weighs about 4 lbs., complete with insulators. Save on maintenance; send for booklet fully describing the Case Aluminum transposition bracket.

Insulators come equipped with rubber bushings which maintain line circuit operation in event of breakage.

Sold By Leading Distributors In The United States

Also Available
CASE ALUMINUM TRANSPOSITION SPAN BRACKETS

CANADA: N. Slater & Company Ltd.—Sydney St., Hamilton, Ontario

Order from your Distributor

TRANSANDEAN ASSOCIATES, Inc.
P.O. BOX 214, ORANGE, N. J.

Consulting Engineers and Constructors

creased use of electronic equipment and electrical gadgets, the number of interference cases requiring field investigation last year approached 22,000.

There is a proportionate increase in other field work, too; such as inspecting radio stations of all types, monitoring the radio spectrum for engineering compliance, furnishing direction finding "fixes" for ships and planes in distress, and obtaining and analyzing technical data for commission use, it is reported.

V V

"The importance . . . of sound regulation to the public generally, to the industries it regulates, to the investors, small and institutional, and the men who guide them, is simply that it has succeeded in preserving for America a free and privately owned utility and transportation system. It is not without significance that only in America, where regulation has developed to the highest refinement, of all the countries in the world, is the rail transportation system still in private hands."—EUGENE S. LOUGHLIN, *president, National Association of Railroad & Utilities Commissioners.*

V V

"If principle is good for anything, it is worth living up to."—FRANKLIN.

North Dakota Association Holds 42nd Annual Convention

THE North Dakota Telephone Association held its 42nd annual convention on Apr. 26 and 27 in Bismarck. The meeting was presided over by Association President V. R. Youhl of Devils Lake, N. D.

Among the speakers at the convention were Warren B. Clay of Hutchinson, Minn., president of the United States Independent Telephone Association, who reported on the activities of the national Independent association; B. F. Stone, staff assistant of the Northwestern Bell Telephone Co., who presented an illustrated talk on "New Sky Waves of Communications."

"The New Look in REA" was the subject of an address by Everett Weitzell of Washington, D. C., chief of the telephone operations and loans division of the Rural Electrification Administration.

Mr. Weitzell said that to him the new look in REA means a changed emphasis. The objective of the REA is to do what Congress intended when the act was enacted—to bring telephone service to as many people as possible in rural areas. He feels that Independent and Bell companies are cooperating with the REA telephone program.

The objective of REA is to provide financing where needed on new projects, and supplemental financing where needed by existing Independent companies.

John Hinrickson, chief engineer of the Northwestern Bell Telephone Co. discussed "Nationwide Customer and Operator Toll Dialing."

Mr. Hinrickson discussed the geographical separation of the country into areas for assignment of area codes essential for the proper administration and progress of customer and operator toll dialing.

He also discussed briefly automatic message accounting and centralized automatic message accounting, and said that this service would be available to Independent companies if they desired, should they be connected to the toll dial network.

He pointed out the importance of Independent companies' engineering central office equipment to be adapted to customer toll dialing.

Mr. Henrickson said that it is a known fact that on short-haul calls, customer toll dialing has resulted in a 30 per cent increase in toll business. Mr. Hinrickson explained in some detail the 2-5 numbering plan in connection with customer and operator toll dialing and urged all Independent companies to consult with Bell companies before engineering or ordering equipment for conversion to dial.

The next speaker was Elmer W. Cart, president of the North Dakota Public Service Commission.

Mr. Cart reported there were 139,680 telephones in North Dakota at the end of 1953, an increase of 77 per cent in the last 10 years.

He said that 52 per cent of the 57,000 occupied farms of the state have telephones. With the advent of REA, it is expected that there will be 4,475 more rural telephones in North Dakota in the near future. This will bring the rural development up to 60 per cent. He predicted that the saturation point will be about 85 per cent. The commissioner said the commission has approved all REA loans where projects have appeared to be feasible, and he pointed out that the commission would not approve loans providing for

TAKE A BIG STEP TOWARD SAFETY WITH DUO-SAFETY LADDERS

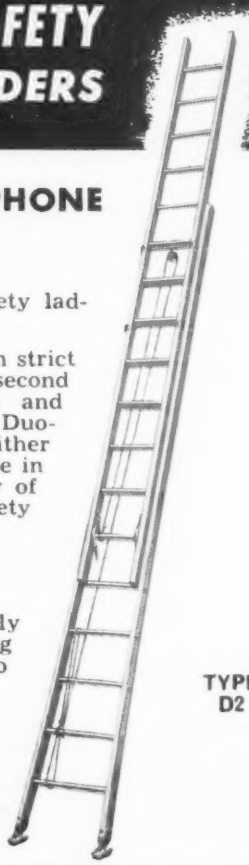
... CUSTOM DESIGNED FOR TELEPHONE MAINTENANCE WORK!

Here's one fine example of the many Duo-Safety ladders ideal for telephone maintenance work.

Type D — a truly great extension ladder built in strict accordance with safety regulations. Rungs are second growth hickory, reinforced with steel rods and equipped with special automatic locks and Duo-Safety's famous Safety Shoes. Made with either straight or parallel side rails, Type D is available in one, two or three sections — in a large variety of sizes. Write for free catalog on all Duo-Safety ladders.

IMMEDIATE DELIVERIES!

Duo-Safety ladders will be shipped immediately upon receipt of order! A planned stock-piling program assures really fast action — there's no delay the Duo-Safety way!



TYPE D2

For Information, Contact Your Supply House, or

DUO-SAFETY LADDER CORP.
809 Ninth Street • Oshkosh, Wisconsin

plant which would duplicate existing facilities.

The last speaker on the program was I. H. Solberg, professor of political science and economics of the Bismarck Junior College.

V V

A. B. Gorman Named President, Nebraska Pioneer Association

A. B. Gorman of Lincoln, Neb., was named president of the Frank H. Woods Chapter of the Independent Telephone Pioneer Association, in a recent statewide election.

Mr. Gorman is advertising manager of the Lincoln (Neb.) Telephone &

A. B. GORMAN

Telegraph Co. and chairman of the public relations committee of the Nebraska Telephone Association.

Results of the election were announced by retiring president Max C. Walker at the chapter's annual banquet and reunion held at Lincoln on May 14. Other officers elected were: W. K. Eno, vice president; Marie Vidlock, secretary; and Robert Clifford, treasurer, all of Lincoln. They succeed Roy Carlson, K. J. Boshart and W. K. Eno, respectively.

Elected to the executive committee for three-year terms were Mae Meduna of Wahoo and Mary Bornemeier of Lincoln.

The Frank H. Woods Chapter represents the state of Nebraska in a nationwide organization of employes with 15 or more years of service in the Independent telephone industry. The chapter was organized in 1941 and has a membership of 500.

V V

"He who knows only his own side of the case knows little of that." — J. STUART MILL.

HUBBARD SERVISLEEVS

Hot Galvanized

It takes only four or five seconds to slip the ServiSleev over the guy wire and drive it into place over the loose ends of the strand. No special tools are needed.

There is no damage to fingers; the installation is quick, neat, secure, permanent. Hubbard ServiSleevs are of unique patented design and are made of heavy galvanized steel that holds its shape and keeps its grip. They are universally used by the largest telephone companies. Available for all standard guy strand.

"Hang the Load on Hubbard Hardware!"

OVERHEAD

Cable Suspension Material—Wireholders Pole Seats and Balconies—Clevises Braces—Drive Hooks—Messenger Dead Ends—Extension Arms—Long Span Material—Pins—Clamps—Guards—Stubbing Bands—Guy Protectors—Guy Clamps Pole Struts—Clips—Straps—Hangers Carriage Bolts—Rings—Transposition Brackets—Eye Bolts—Pole, Corner and House Brackets—Guy Hooks—Strain Plates—Storm Guy Straps—Lags—Machine and Hubeye Bolts—Sidewalk Guys REA Telephone Hardware

UNDERGROUND

Cable Racks—Manhole Ladders and Steps Pulling-in Irons—Expanding Anchors Cable Shields—Screw Steelwing Anchors Anchor Rods—Ground Rods and Clamps

HUBBARD AND COMPANY

ESTABLISHED 1845

PITTSBURGH • CHICAGO • OAKLAND, CALIFORNIA

Harmon, Kenefake and Helm Named GE Sales Managers

It was recently reported that three new sales managers have been appointed to the communications equipment unit of the General Electric Co. commercial equipment department at Syracuse, N. Y.

They are Neal F. Harmon, sales manager for mobile communication equipment; Edwin W. Kenefake, sales manager for microwave equipment; and James D. Helm, sales manager for special accounts.

The three men will make their headquarters at Electronics Park in Syracuse, and will report to L. Robert Sheeley, manager of sales for General Electric communications equipment.

Mr. Harmon is a native of Dumas, Ark., and a graduate of Hendrix College and the University of Arkansas. He has been with General Electric for 23 years.

During World War II he served in the Navy, engaged in radar work. He went to Syracuse in 1950 following several years in the company's electronics division office in Atlanta. Prior to his new appointment, he had been coordinating the sale of communication equipment for civil defense and industrial applications.

A native of Robinson, Ill., Mr. Kenefake holds B.S. and M.S. degrees from the University of Notre Dame. He joined the General Electric Co. at Schenectady in 1936, subsequently serving in a number of engineering posts there and at Bridgeport, Conn., and at Syracuse.

He became section engineer for carrier current communication engineering in 1949, and since 1950, has been assistant sales manager for communication equipment.

A native of Cortland, N. Y., Mr. Helm attended Colgate and Ohio State universities. Prior to joining General Electric in 1943, he held sales positions in electrical machinery and printing firms.

He served the company at Syracuse in several accounting positions, and in 1945 became a sales engineer for communications equipment. He was sales manager for special industrial accounts of the commercial equipment department prior to his new position.

V V

"Individuality is everywhere to be spared and respected as the root of everything good."—RICHTER.

EDWIN M. BLAKESLEE, president of General Telephone Co. of California and immediate past president of the United States Independent Telephone Association, shows how the modern dial system operates during his recent talk before the Santa Monica, Cal., Rotary Club. Mr. Blakeslee, who has been appearing before service clubs, chambers of commerce and other civic organizations throughout his company's territory, presents a telephone industry program covering, in addition to the dial demonstration, the relationship of the Independent industry to the Bell System, and the development of the telephone.

Construction
and
WITH THE DOUB
STROMBERG-CARLS
LEADI

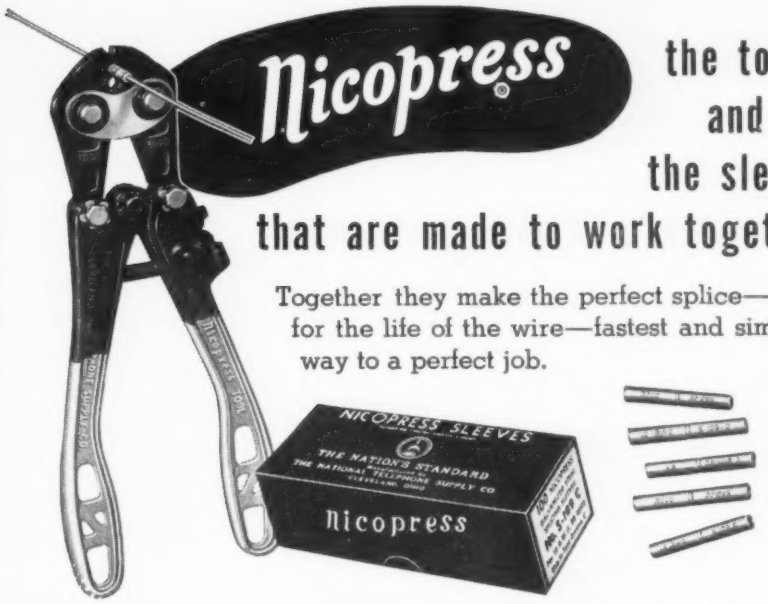
For LOWEST COS
RURAL LINES
use
Copperweld
O-Eighty-
Thirty
LINE WIRE

For your short subscriber loop
and secondary toll lines, ge
peak performance at lowest co
by stringing Copperweld O-
Eighty - Thirty — the new rura
telephone line wire that com
bines the savings of long-spa
construction with the economie
of a smaller, lighter, non-rustin
conductor. In addition to its pe
manent high strength, it has ex
cellent voice and high frequenc
transmission characteristics.

Plan now to build your rura
lines with Copperweld O-Eighty
Thirty. You'll soon discover it
unequaled in economy.

Copperweld
O-Eighty-Thirty
EXTRA HIGH-STRENGTH
TELEPHONE LINE WIRE
.080" Diameter 30% Conductivity

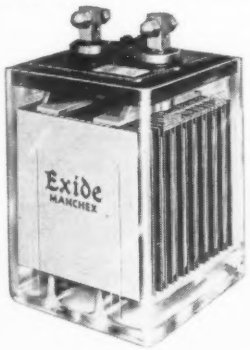
naterials
Supplies
JARANTEE OF
ND AMERICA'S
ANUFACTURERS



the tool and the sleeve that are made to work together

Together they make the perfect splice—good for the life of the wire—fastest and simplest way to a perfect job.

Exide-Manchex
telephone batteries



assure positive operation

For Central Office and Private Branch Exchange Equipment

his is proven daily in exchanges of every size . for over 60 years Exide Batteries have been erving the Telephone Industry . . . the Manhester positive plate with its exclusive button ype construction provides exceptionally long fe . . . latest developments on molded glass ars permit compact space saving installation . . heavy terminal posts with copper inserts rovide extra conductivity for sustained voltge at high discharge rates . . . microporous ubber along with slotted plastic separators, re impervious to chemical and electrical reactions . . . plastic spacers assure plate alignment . . . for assured dependability, long life nd low-cost maintenance use Exide Manchex.

The Electric Storage Battery Co.
Philadelphia, Pa.

988 . . . Dependable Batteries for 66 Years . . . 1954

crapo

guy and messenger galvanized strand

The superior tensile properties inherent in steel are used to full advantage in *Crapo* Galvanized Strand. The tightly adherent zinc coating applied by the *Crapo* Galvanizing Process provides lasting protection against corrosion, and prolongs the life of the strand. Controlled ductility makes *Crapo* Strand easy to work and to serve. Low first cost and low yearly cost result in important economies for operating companies.

The all-round dependability of *Crapo* Galvanized Steel Strand is being demonstrated constantly by its outstanding performance in service. There is a size and grade for all practical needs.

LONG LIFE—LOW COST

Distributed by

STROMBERG-CARLSON

ROCHESTER • CHICAGO • ATLANTA • KANSAS CITY • SAN FRANCISCO • TORONTO

High Fidelity Radios and Radio-Phonographs

Office Intercom Equipment

Electronic Carillons for Churches and Public Buildings

Sound and Public Address Systems

"Panoramic Vision" Television Receivers

AND MANY OTHER ELECTRONIC PRODUCTS FOR OUR ARMED FORCES

TYPE S-1
SUBSCRIBER CARRIER
Deliveries now being made!

Here is a preview of a message with photographs we're preparing for June issue:

One month trial—*no obligation!*
One year guarantee—*all components!*
Price per carrier channel $790.
Separate power supply with combination signalling and termination $390.
We hope you will read our complete story in a few weeks.

McELROY
MANUFACTURING CORP.
Littleton, Massachusetts, U.S.A.

G. A. BERTING

H. Y. KRAEPELIEN

Berting and Kraepelien Named Chairman, President of North

G. A. Berting has been elected chairman of the board of the North Electric Mfg. Co., and Hans Y. Kraepelien has been elected president, effective June 1.

Mr. Kraepelien has been with L. M. Ericsson Co. for 25 years. Prior to World War II he was employed in operations with the Ericsson companies in Poland and Italy. Subsequent thereto he became a staff engineer working in Stockholm, Sweden.

After coming to the United States in 1945, Mr. Kraepelien was made president of Ericsson Telephone Sales Corp. in New York City in which capacity he has acted ever since.

Mr. Kraepelien is a graduate of the Royal Institute of Technology, Stockholm, and presently is completing the advanced management program of the Graduate School of Business Administration, Harvard University. He is an American citizen, married, and has two daughters and two sons.

Mr. Kraepelien expects to be in Galion, O. shortly after June 1.

V V

Joslyn Mfg. & Supply Co. Elects New Officers

At its recent annual meeting, the board of directors of the Joslyn Mfg. & Supply Co. of Chicago, accepted Ralph C. Boozer's request to be relieved of his responsibilities as secretary-treasurer, offices which he has held since 1927.

Mr. Boozer joined the Joslyn Mfg. & Supply Co. in 1911. He was elected assistant secretary on Dec. 12, 1924. In January, 1927, he was elected to the office of secretary and also a member of the board of directors.

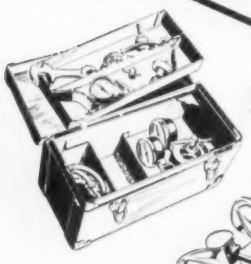
On July 13, 1927 the board of directors appointed Mr. Boozer secretary-treasurer; he will continue as a member of the board of directors.

Following Mr. Boozer's request, the Joslyn company's board of directors elected the following officers:

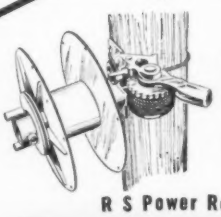
George B. Sturtz, formerly assistant secretary, was elected secretary, and D. Jack Hart, formerly assistant treasurer was elected treasurer, both for the ensuing year. The board also elected Leon J. Streit as comptroller.

GENERAL MACHINE PRODUCTS COMPANY, INC.
7th & Wood Sts.
Philadelphia 6, Pa.

Aerial Tents
Cable Benders
Cable Blocks
Cable Lashers
Coaxial Cable Tools
Lashing Wire Clamps and Grips
Portable & Power Reels

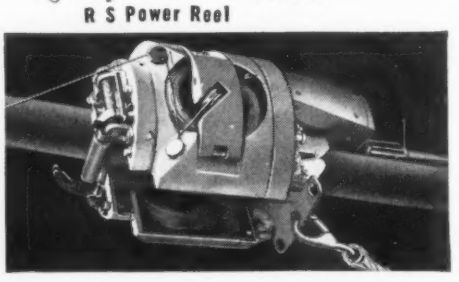


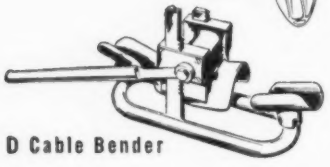
Pressure Testing Kit



R S Power Reel

C R Power Reel





D Cable Bender

Distributed by Graybar

B, C, D & E Cable Lashers

Special Purpose Tools To Specifications
Literature on Request

Over 250 various items of Line Construction Tools, Maintenance & Pressure-Testing Equipment in stock for immediate Shipment

SPECIALIZED COMMUNICATIONS EQUIPMENT SINCE 1918

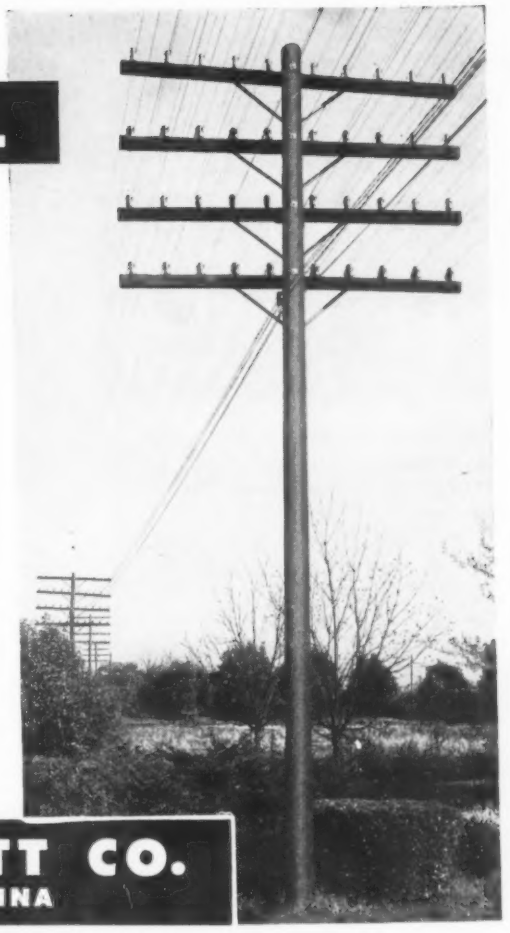
GMPCo

MOST ECONOMICAL

Taylor-Colquitt
SUPERIOR PINE POLES

Stronger because they're rigidly selected from the finest stands of Southern Pine . . . longer lasting because they're given the most effective preservative treatment so far developed by modern technology . . . Taylor-Colquitt Superior Pine Poles are the most economical type that can be installed.

Taylor-Colquitt Superior Pine Poles are distributed to independent telephone companies exclusively by Automatic Electric Sales Corporation, 1033 West Van Buren Street, Chicago 7, Illinois.



TAYLOR - COLQUITT CO.
SPARTANBURG, SOUTH CAROLINA

PLANTS AT SPARTANBURG, SOUTH CAROLINA AND WILMINGTON, NORTH CAROLINA

THE ABC BOOKS CAN HELP YOU WITH YOUR PLANT TRAINING PROBLEMS

Hundreds of telephone companies in the United States, Canada, and other countries give copies of Vol. I and Vol. II of "ABC OF THE TELEPHONE" to every plant man.

HERE IS WHY:

They are written in the language of the plant man.

They help new men learn faster. Experienced men gain knowledge and appreciation of the job.

HERE ARE SOME OF THE SUBJECTS INCLUDED:

VOLUME I—84 PAGES.
Circuits, transmitters, receivers, induction coils, generators, ringers, relays, line protection, dials, drop wire installation.

VOLUME II—80 PAGES.
Station installation, fault locating, circuit analysis, maintenance, testing outside plant, loading coils, etc.

HERE ARE THE REASONABLE ABC PRICES:

Single copies .....$1.50 ea.
2-25 copies ..... 1.35 ea.
26- 50 copies .....$1.20 ea.
51-500 copies ..... 1.05 ea.
500-1000 copies.....$0.95 ea.

USE THIS CONVENIENT ORDER BLANK TODAY:

FRANK E. LEE, *Publisher*
1751—183rd St., Homewood, Illinois

Please send:

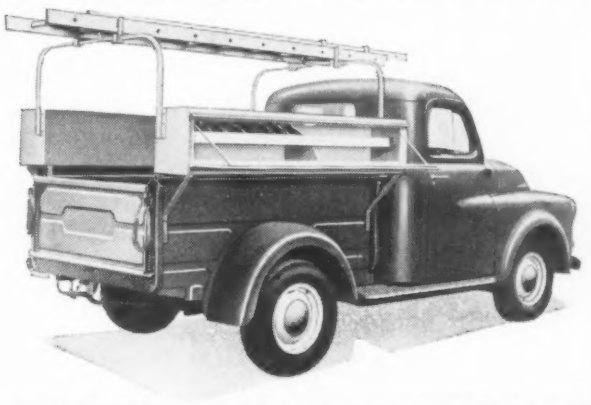
___ ___ Copy(ies) ABC OF THE TELEPHONE—VOLUME I
___ ___ Copy(ies) ABC OF THE TELEPHONE—VOLUME II

NAME_____

STREET_____

CITY AND STATE_____

STAHL SIDE BOXES



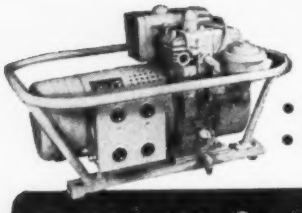
CONVERT YOUR "PICK-UP" TO A MODERN SERVICE TRUCK!

Quickly...and at low cost...you can mount these All-Steel, Welded Side Boxes on ANY MAKE OR MODEL of pick-up truck. Keep tools and equipment dry, safe, organized.

Write today for Literature and Prices

AVAILABLE THROUGH LEICH SALES CORP., CHICAGO 6, ILL.

STAHL METAL PRODUCTS, INC.
3490 W. 140TH ST., CLEVELAND 11, OHIO



• CUTS COSTS
• SPEEDS WORK

KATOlight
Portable **POWER**
for your crews!

KATOLIGHT has portable dolleys and carrying brackets available, making Katolight Plants easily available to plug in time-saving equipment such as light saws, drills, man-hole heaters, and other electrical tools.

Gasoline models from 350 Watt through 42 KVA. DC Models available 500 watt through 15 KW in standard voltages for continuous and standby service.

Also Multi-Frequency Ringing Power Equipment

WRITE TODAY

Flood or Spot Light

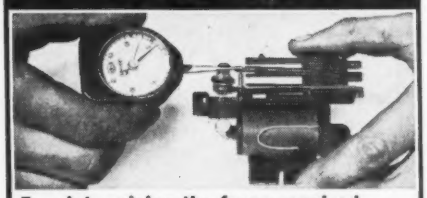
Chain Tree Saws

Drills and Tools

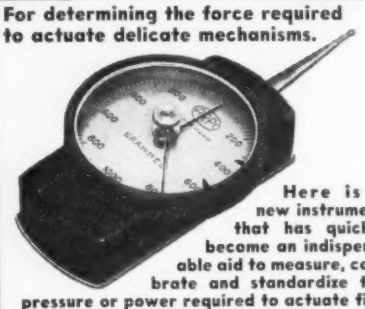
Manhole Heaters

KATOLIGHT CORPORATION
Box 491-12 Mankato, Minnesota

NEW PRECISION DYNAMOMETER



For determining the force required to actuate delicate mechanisms.



Here is a new instrument that has quickly become an indispensable aid to measure, calibrate and standardize the pressure or power required to actuate fine precision mechanisms and spring tensions of ELECTRIC CONTACTS - RELAYS - CLOCKS - TELEPHONES - BUSINESS MACHINES - MICRO MOTORS for Electric Razors - WINDSHIELD WIPERS - TIME SWITCHES - ETC...

THE DYNAMOMETER IS AVAILABLE IN 2 SIZES WITH OPERATING PRESSURES RANGING FROM 5-15 GRAMS TO 100-1000 GRAMS.

WRITE FOR ILLUSTRATED FOLDER

GEORGE SCHERR CO., Inc.
200-TY LAFAYETTE ST. • NEW YORK 12, N. Y.

Stromberg-Carlson Co. Honors 25-Years-Service Employes

Three hundred and sixteen engraved gold watches were presented to employes having 25 or more years of service with Stromberg-Carlson Co. at a special meeting of the Quarter Century Club on May 18 in Rochester, N. Y. Robert C. Tait, Stromberg-Carlson president, made the presentations.

The combined service of the club members with the company is 10,507 years.

Special guest for the evening was Leslie P. R. Bean, governing director, Stromberg-Carlson (Australasia) Proprietary Ltd., Sydney, Australia.

C. Robert Larson, of Rochester, "copped the honors" for having the longest service record. He started with the company in 1899 and retired in 1947. Miss Minnie Maurhofer, also of Rochester, was similarly honored for having the longest service record for women; she started in 1903 and retired in 1949.

George E. Eyer, assistant secretary and industrial relations manager, had the longest service of active employes—47 years.

Miss Tessie Croft was named chairman of the group, and James Smith vice chairman, by Clifton O. Dasson, outgoing chairman.

New members were also initiated. They were Salvatore Alparene, Clifford W. Austin, Helen Bach, John F. Burns, Clarence W. Byers, George Dorschell, Mary Engert, William Fay, J. LeRoy Flesch, Wilbert J. Fraser, Clifford Graves, Carl G. Julstrom, Clifford J. Hunt, Floyd J. Kates, Harry Kerr, William Kramer, William C. Lewis, Rolland B. Maxon, J. E. McCauley, Gertrude Neumann, Sigurd Nilssen, Otis Pearson, Lyman S. Personeus, Sadie Reandeau, Carolyn A. Renner, Henry Schlieman, Alphonse Vander Brook, Margaret C. Wilson, Dorthea Wolfe, Emma Worden, and Stefan E. Wright.

V V

Duo-Safety Ladder Corp. Has Immediate Delivery Plan

Duo-Safety Ladder Corp. of Oshkosh, Wis., manufacturer of telephone and other types of industrial ladders has announced a plan to insure immediate delivery of ladders upon receipt of orders.

Under this program, a percentage of all production is earmarked for stock, and stored in a new warehouse recently erected near the Duo-Safety company's plant.

Begun several months ago, a stockpile of all types of ladders is now on hand in the new warehouse—ready for immediate shipment.

Duo-Safety manufactures both wood and aluminum ladders of all types—extension, step, folding and sectional—including several specifically designed for telephone company work.

A catalog on all Duo-Safety Ladders is available which provides information on types, sizes and specifications. To obtain a copy, write directly to Duo-Safety Ladder Corp., 809—9th St., Oshkosh, Wis.

V V

Preformed Names Ruhlman Technical Director

Thomas F. Peterson, president of Preformed Line Products Co. of Cleveland, O., recently announced the appointment of Jon R. Ruhlman as technical director of the company's engineering and research activities. He succeeds Jess C. Little.

After receiving his B.S. degree from Purdue University, Mr. Ruhlman

J. R. RUHLMAN

taught vibrations and structure at the University of Colorado while gaining his M.S. degree.

He joined the research engineering department of Cleveland Pneumatic Tool Co. In connection with his structural research and testing, he had several papers published.

From Cleveland Pneumatic, he went to the dynamic branch of the U. S. Air Force at Wright Field. There Mr. Ruhlman gained experience in the theoretical and experimental research of aircraft vibration and flutter and was selected to serve as a technical consultant to companies such as Boeing, Douglas, and others.

In 1952, he joined Preformed Line

INSPECTION SERVICE
Of poles, crossarms, and preservative treatments. Analyses of wood preservatives. Consulting and specification writing. Inspectors stationed throughout U.S.A.
A. W. WILLIAMS INSPECTION CO.
MOBILE, ALABAMA
ESTABLISHED 1921—MEMBER A.C.C.L.

THE AMERICAN APPRAISAL COMPANY
INVESTIGATIONS • VALUATIONS REPORTS
CHICAGO • MILWAUKEE • NEW YORK
WASHINGTON • And Other Principal Cities

CYRUS G. HILL
ENGINEERS
PLANT — TRAFFIC — COMMERCIAL
VALUATIONS AND ORIGINAL COST
134 S. LA SALLE STREET, CHICAGO 3

SLOAN, COOK & LOWE
CONSULTING ENGINEERS
Appraisals—Original Cost Studies
Plant, Traffic and Commercial Engineering
120 S. La Salle St.
Chicago 3, Ill. Tel.: FRanklin 2-5924

Installation Specialists
CENTRAL OFFICES
INSTALLED—MODIFIED—ENLARGED
COMMUNI-CATERING
P.O. BOX 6712 CHICAGO 7, ILL.

ROBERT E. FOLEY CONSTRUCTION CORP.
DESIGN—SURVEYS—APPRAISALS—Construction and Maintenance of Overhead and Underground Telephone Plant. Complete supply of poles available for emergency requirements.
43 GRISWOLD STREET
BINGHAMTON, N. Y. TEL. 2-7215

CABLE SPLICING
A SERVICE THAT SATISFIES
Construction & Maintenance for all Telephone Cables
J. O. MORTON CO.
CABLE SPLICING CONTRACTOR
P.O. BOX 11 TEL.: 2515 PEKIN, ILLINOIS

Construction Crews Station Installers
Central Office Installations
Cable Splicers Complete Engineering
HENKELS & McCOY
1418 Baldwin Bldg. Erie, Pa.
Now Operating in 20 States

CONSULTING ENGINEERING
CONSTRUCTION MAINTENANCE OPERATION
MICROWAVE TELEPHONE RADIO
Studies • Research • Reports
TELELECTRO ENGINEERING SERVICE
CHESTER M. ROBBINS
P.O. Box 321 Colorado Springs, Colo.

Products Co. as assistant technical director.

Mr. Ruhlman is an Associate Member of AIEE and a member of Tau Beta Pi, ASTM and IAS.

V V

". . . Free speech is to a great people what winds are to oceans and malarial regions, which waft away the elements of disease, and bring new elements of health. And where free speech is stopped, miasma is bred, and death comes fast." —BEECHER.

SYMBOL

"In a large sense, atomic energy is simply one of the striking symbols of man's long search for knowledge—knowledge of the world around him and knowledge of man himself. The progress of man is largely a matter of how we use this slowly won knowledge to build the kind of world we want. Knowledge by itself is neither good nor evil. The real question is how we use that knowledge which is the indispensable tool we must have to solve the world's problems." —JOHN R. DUNNING, *dean, Columbia University, School of Engineering.*

UNDERGROUND CONSTRUCTION
Cable and Wire Plow
Trenching Machines
Fully Equipped for Complete Installation
BJORNSON CONSTRUCTION CO.
Bode, Iowa Phone 2553

TELEPHONE CONSTRUCTION, INC.
Consulting, Engineering, Installation, Good Machinery, Competent Workmen
Pole Digging and Cable Splicing
Complete contracting service available.
C. H. DAUBENDIEK
Secretary
Box 267, Telephone 012, JEFFERSON, IOWA

WE BUILD AND REPAIR TELEPHONE PLANTS FROM CENTRAL OFFICE TO SUBSCRIBER
CABLE SPLICING & REPAIRING
WILTON ELECT. & TELEPHONE CONSTRUCTION CO.
ANDY MUELLER, Engineer
Telephone 21 Wilton Junction, Iowa

TELEPHONE PRINTING
By People Who Know the Telephone Business
SEE THE SUTTLE CATALOG
SUTTLE EQUIPMENT CO.
LAWRENCEVILLE ILLINOIS

Reduce installation costs

in underground cable systems

Transite* Ducts speed installation. Lightweight, long lengths are easy to assemble; save time and labor.

Transite Ducts are adaptable. Readily cut and tapered in the field. Full line of fittings simplifies directional changes.

Transite Ducts ease cable pulling. Smooth bore reduces friction and abrasion . . . permits easy insertion or removal of cables.

Transite Duct installations are permanent because they are immune to rust, rot and electrolysis . . . resist corrosion and withstand all normal soil stresses.

For the complete story, write Johns-Manville, Box 60, New York 16, N. Y.
*Reg. U. S. Pat. Off.

Johns-Manville
TRANSITE CONDUIT
for use exposed and underground without concrete encasement

New!

Developed by independent telephone engineers specially for small and medium companies . . .

hook-switch HOWLER

Solves improper subscriber-disconnects from Central Office. Will quickly (often within a month) pay for itself. The line is automatically clear when subscriber hangs up. Uses standard telephone DC voltages. Simple to use. Portable. 10 year life.

Order one now—end your troubles.

TELE-SYSTEMS, INC.
6442 Santa Monica Blvd.
Los Angeles 38, Calif.

CLASSIFIED SECTION

Rates 15 cents per word payable in advance. Minimum charge $3.00 for 20 words or less. Classified advertisements must reach us 8 days before publication date.

FOR SALE

WDITT
TELEPHONE FIELD WIRE
(Continuous 1-Mile Length)

Latest style Signal Corps, Thermoplastic jacket, 2-conductor twisted pair (4 copper, 3 steel). Spliced with 3-045B Nicopress Sleeves and sealed with air-tight plastic sleeves.

Continuous 1-Mile Reel—$20.00

NEW SPINNING WIRE

.091 Aluminum Spinning Wire with cone shaped hub. Per Spool—$2.50

NEW RECEIVER CORDS

36" Brown Receiver Cords—spade & spade Per Dozen—$1.80

TELEPHONE REPAIR & SUPPLY COMPANY

1760 Lunt Avenue Chicago 26, Ill.

TELEPHONE EXCHANGE IN SOUTHEASTERN NEBRASKA—300 station magneto telephone exchange, plant rebuilt in 1949, in good condition. Must sell due to clearing of estate. Write Box No. 134, Lawrence, Nebr.

USED 1½ TON 1941 UTILITY CONSTRUCTION TRUCK with cable, winch and derrick. Dennison Motor Sales, Crandon, Wis.

FOR SALE

NEW EQUIPMENT

VOICE FREQUENCY RINGERS

Federal 101A, Single channel ringer. For signalling over any voice-frequency circuit such as a carrier channel, radio link, or through repeaters. Mounted in heavy carrying cases, or can be rack mounted. Includes 20 cycle supply. Rings at 0 or plus 6 dbm at 500/20 or 1000/20 cycles, over a circuit with 30 db loss. Operates from 115 or 230 volts AC or 12 volts DC. Signal Corps type TP-8 ..... $50.00

TERMINAL REPEATERS

For use on four wire lines either as a through or terminal repeater. Mounted in carrying case, or can be rack mounted. Consists of two each, 2-stage amplifiers arranged so that inputs or outputs can be switched for either 300 ohm or 1200 ohm impedance to line or 600 ohm when used as terminal repeater. Operating gain each amplifier of 35 db at 1000 cycles. Self contained power unit for either AC or 12 volt DC. Signal Corps type TP-7 ..... $50.00

TELEPHONES

Desk type, w/handset and dial, Federal 803AE straight line ringer $20.00

CORDS

Patching w/PL-47 (equiv. to 347) 3' lg plug on either end, green $1.10

KEYS

Switchboard type, position 1 non-locking w/1 set of make; position 2 locking w/2 sets of make $1.25

TELEPHONE HEADSETS

Consisting of type 11 Headbands, 2 ea. 716A Receivers, 1 ea. 5 ft. cord complete with a 289B Plug $5.50
684 BA Subscriber Sets (Ringer Box) $5.00

METROPOLITAN TELEPHONE SUPPLY CORP.

254 Navy Street, Brooklyn 1, New York

FOR SALE

NEW KELLOGG #41 POLE CHANGERS, 20 Cy, 100 Volt, INPUT —24 Volt BATTERY, limited supply, $15.00 each. Telephone sets, Leich #90—St. Line, Self-contained, reconditioned, $10.00 each. Prices FOB Chicago, Ill. Independent Telephone Repair Co., 2137 S. 21st St., Chicago 8, Ill.

SWITCHBOARD LAMPS — 6 volt, .035-.045 amps, G.E. type 6C. Original boxes of 100 at $8.00 — ten boxes for $70. Lot price for 10,000 lamps—$550. F.O.B. Philadelphia. J. N. Fineberg, 1804 Market St., Philadelphia 3, Pa.

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

Cascade Pole Co., P.O. Box 743, Tacoma, Wash. — Creosoted Douglas Fir and Cedar Poles.

C. M. Christiansen Co.—Northern White Cedar Poles, Pentachlorophenol treated. Plant and Yards, Phelps, Wis.

Dierks Lumber & Coal Company, Wood Preserving Division, 700 Dierks Building, Kansas City, Missouri. Southern Pine select poles, all sizes and lengths, creosote and penta-pressure treated. Prompt shipment.

Eppinger & Russell Co., 80—8th Avenue, New York 11, N. Y.—Creosoted Poles and Cross Arms. Plants: Jacksonville, Fla., Norfolk, Va., Eddington, Pa.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants: Beaumont and Texarkana, Texas.

Montana Pole & Treating Plant, Butte, Montana. — PENTA Lodgepole Pine & Western Larch Poles. Pressure or Non-Pressure Treatment.

T. M. Partridge Lumber Co., 731 Lumber Exchange, Minneapolis, Minn.—Northern white and western red cedar poles, creosote and pentachlorophenol treatments.

Texas Creosoting Company—512 Main Street, Orange, Texas—Creosoted Southern Yellow Pine and Douglas Fir Poles. Can also treat with "Penta."

DIAL PABX SWITCHBOARD

Western Electric #740-C Dial PABX Switchboard, wired for 5 trunks and 40 lines. Equipped with 2 trunks and 38 lines. Wired for 7 connectors (connecting circuits) equipped with 4. Complete with power equipment, ringing equipment and 2 attendants key cabinets. Less batteries. Approximately 6 years old and in good condition.

Federal #25-C Dial PABX Switchboard, wired and equipped with 5 trunks and 25 lines. Complete with attendants key cabinet and battery eliminator. Practically new condition.

EMERGENCY POWER SUPPLIES

Homelite Model 25A208/120/3/60-9A gasoline motor generator set with 4.5 KW 208/120 3 phase 60 cycle output. Portable and has 48 volt D.C. starter terminals or can be started manually. Auxiliary gas tanks. One unit complete with outdoor housing.

BUCKEYE TELEPHONE & SUPPLY COMPANY

1250 KINNEAR ROAD COLUMBUS 21, OHIO

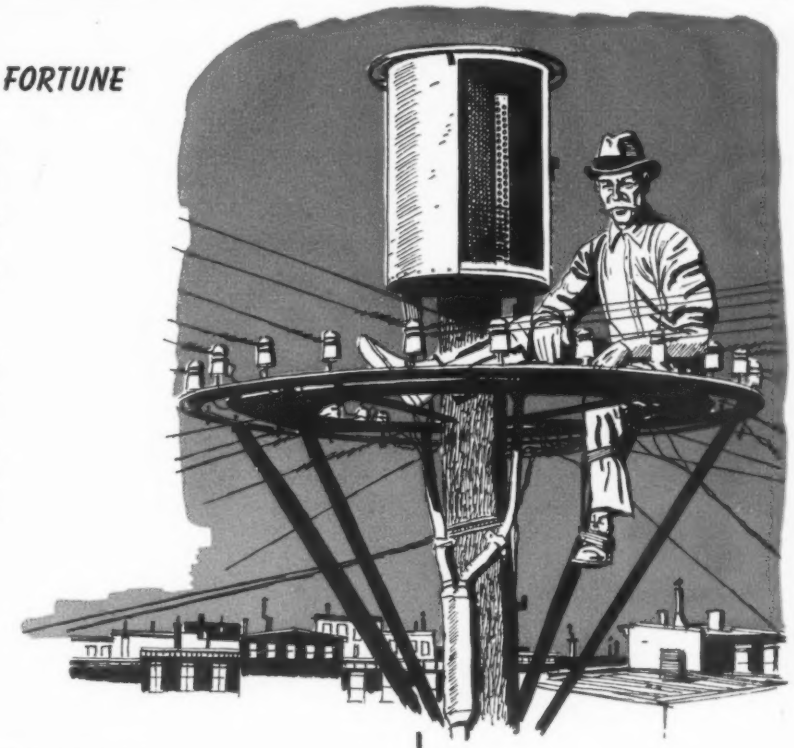
Kingswood 0655

GraybaR TELEPHONE NEWS

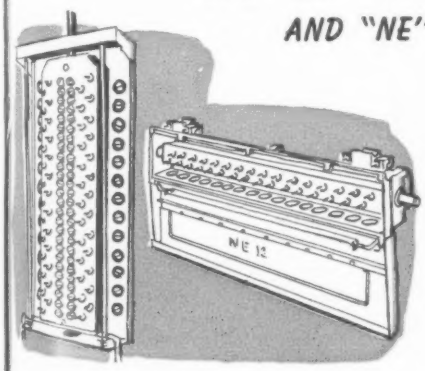
WHEN A LINEMAN'S FIGURE WAS HIS FORTUNE

It's easy to see why telephone companies in the 80's might have kept a wary eye on employee waistlines—only a trim, athletic lineman could squeeze his way through the clutter of spokes, braces, cables, and tangled wire at the top of this typical open wire junction pole.

Crude beginning to be sure, yet improvization of this type fathered many of the carefully-engineered cables, cable terminals, and accessories distributed by Graybar today. Here are just a few of these specialized items promptly available through our 109 strategically-located offices and warehouses.



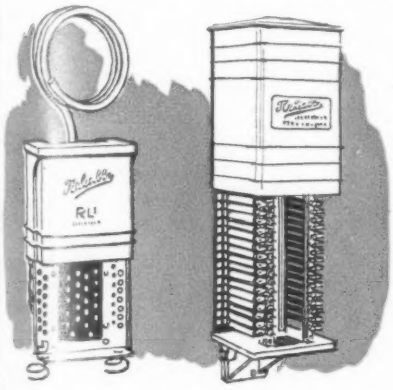
TYPE "NC" AND "NE" CABLE TERMINALS



An unprotected type, the NE terminal consists of a housing of cast aluminum alloy containing removable selectron binding post chamber and 24-gauge paper-insulated cable stub.

Similar in construction the NC unit features a built-in protector block, using the screw-in 107B protector. Both types are available in 10- and 16-pair cable-supported models and in a 26-pair unit for vertical pole or wall mounting.

RELIABLE TYPE "RU" AND "B" POLE-MOUNTED CABLE TERMINALS



A reversible unprotected terminal, the type RU unit can be installed either stub-up or stub-down. The flat fanning plate in combination with a cover surrounding the wires assures a weather-proof installation. 6-, 11-, 16- and 26-pair models.

The protected type B unit is equipped with Reliable's new self-cleaning sawtooth discharge blocks that eliminate carbon problems. Heavy silicon bronze binding posts insure freedom from season cracking. In 11-, 16-, and 26-pair models. 331-236

EVEN A GOPHER GETS INDIGESTION

In addition to protector mountings and protectors of many types, Graybar also distributes a wide variety of standard and special cables—even a type designed to be particularly displeasing to Gophers. Whether you need tape-armored, jute, galvanized-armored, corrosion-protected, or wire-armored submarine, there's a cable to meet the conditions in your locality . . . and Graybar can supply it.

For complete details on any telephone need consult your Graybar Representative.

GRAYBAR ELECTRIC CO., INC.
Executive Offices:
Graybar Building, New York 17, N. Y.
IN OVER 100 PRINCIPAL CITIES

Call Graybar first for...

GraybaR — *Everything in Telephone Supplies*